ENGINEERING NEWS-RECORD

A start for the longest suspension span p.24

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faster swings...15% higher output with the Magnetorque-equipped 1025A

...$12,000 worth of bonus extras come as standard equipment on this 3½-yd. P&H

This big P&H 1025A, like all shovels, swings two times for every other work motion it performs. This important work motion is one place you get a big bonus with the 1025A, because it gives you the fastest swing acceleration and deceleration in the 3½ yd. class.

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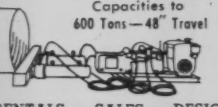

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ENGINEERING NEWS-RECORD Vol. 166, No. 26, JUNE 29, 1961

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Printed at Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders. Publisher reserves the right to refuse unqualified subscription.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail postage paid at Albany, N. Y. Printed in U.S.A. Title registered in U.S. patent office. ©Copyright 1961 by McGraw-Hill Publishing Co., Inc. All Rights Reserved. **UNCONDITIONAL GUARANTEE:** Our primary aim is to provide subscribers with a useful and valuable publication. Your comments and suggestions for improvement are encouraged and will be most welcome. The publisher, upon written request, agrees to refund the part of the subscription price applying to the remaining unfilled portion of the subscription—if editorial service is unsatisfactory.

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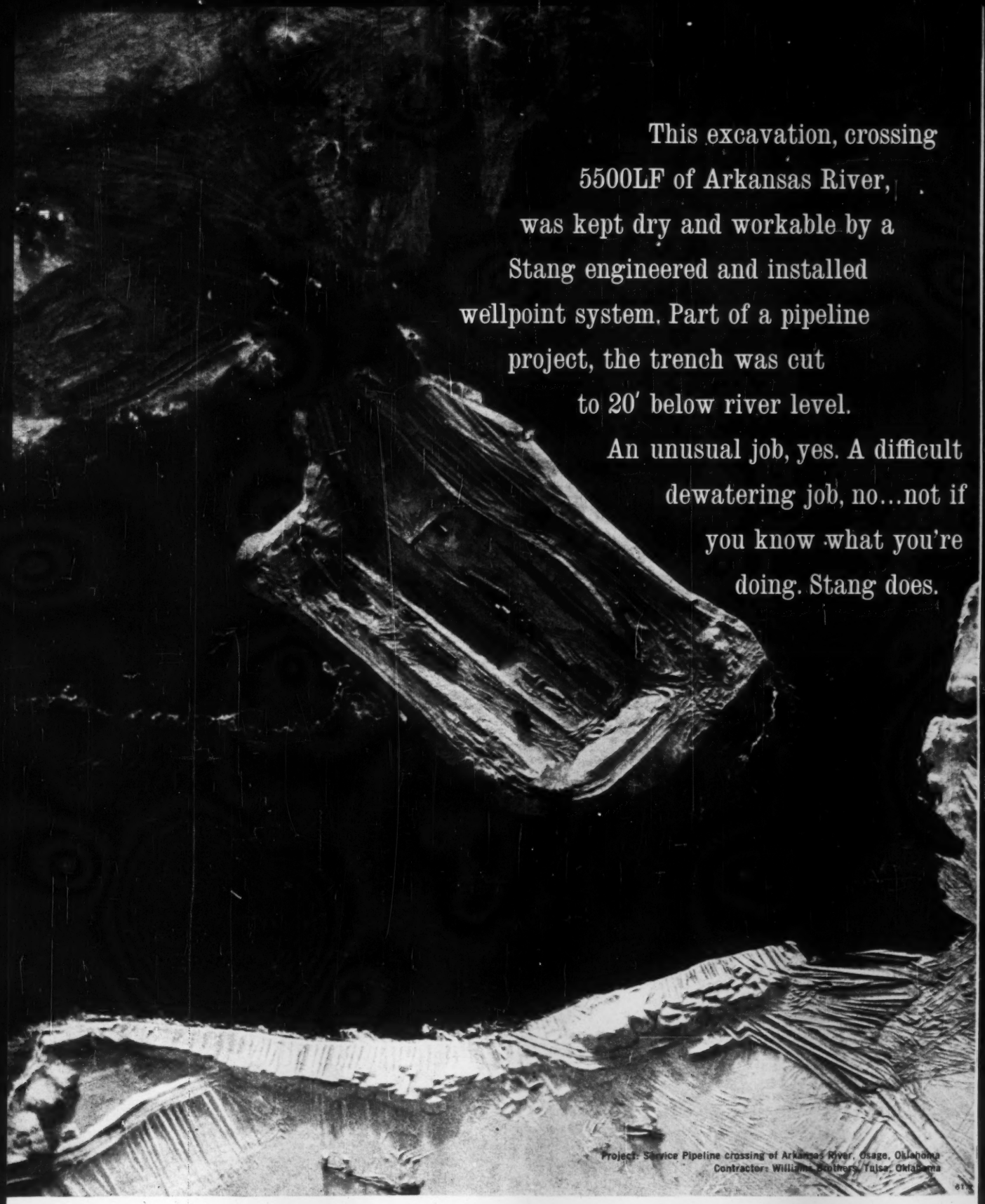
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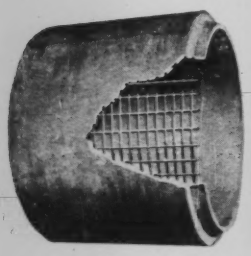

Steel reinforced

for longer life in storm sewer service!

Concrete pipe reinforced with strong USS AMERICAN Welded Wire Fabric solves drainage problems.

Albuquerque, like most southwestern cities, is spreading out. You see new construction almost everywhere you look. This photograph shows some of the activity that goes into transforming the wide open countryside into new residential areas. It was taken in the North East Heights development and shows the laying of reinforced concrete pipe for a storm sewer. In this project, approx. 17,000 lineal feet of reinforced concrete storm sewer pipe from 24″ dia. through 72″ dia. was laid.

The pipe shown is 72″ pipe, and every foot of it was *steel-reinforced* with USS AMERICAN Welded Wire Fabric to give it the strength and durability to withstand heavy loads and assure long service life. It was pre-tested to meet the rigid requirements of ASTM Specifications C76-57T, and will withstand loads exceeding 100,000 lbs.

A large number of concrete pipe manufacturers are using USS AMERICAN Welded Wire Fabric to get greater strength and durability. This quality wire fabric is made on precision machines to the closest of tolerances ±0.003″—with center to center spacings held to ¼″. It is prefabricated from cold-drawn, 60,000 psi min. yield strength wire. All intersections are electrically welded to assure positive mechanical anchorage in the concrete. For more information about USS AMERICAN Welded Wire Fabric—write American Steel and Wire, Dept. 1194, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

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Project: Storm Sewers, North East Heights, City of Albuquerque, N.M. **Engineers:** Gordon Herkenhoff & Associates. **Contractor:** C. R. Davis Contracting Company. **Product:** Reinforced Concrete Pipe ranging in size

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Designed for 800 students, this school consists of 39 classrooms, including science rooms, art rooms, home economics classrooms and laboratories, music rooms and shops. Each classroom has a separate workroom space. Also provided is a library, administrative office, health and guidance facilities, two cafeterias, a large gymnasium and separate locker rooms for boys and girls. The auditorium seats 830. Service areas include a kitchen, boiler room and general storage. Dimensions: area—123,908 sq. ft.; cubage—1,792,762 cu. ft. ***Architects and Engineers:*** **Sargent, Webster, Crenshaw & Folley, A.I.A., Syracuse, New York**

Another new school selects...

NEW CARRIER HEATING AND VENTILATING SYSTEM THAT PROVIDES 8 ADVANTAGES YET COSTS LESS

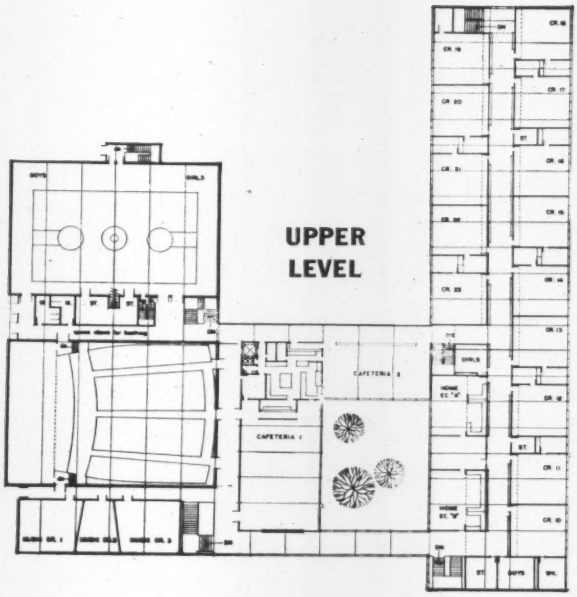
This modern junior high school provides another excellent example of how any new school can enjoy a superior heating and ventilating system at less than the cost of ordinary unit ventilators. And this new kind of system is ready for immediate conversion to year-round air conditioning with the simple addition of packaged refrigeration equipment in the machine room.

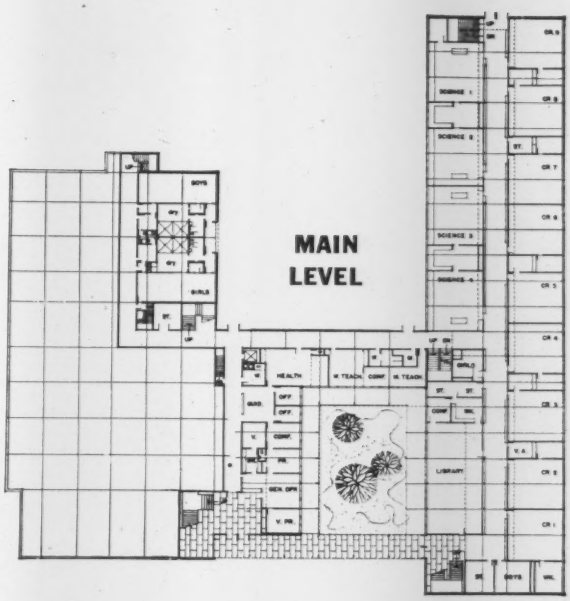
In their recent planning of new schools the architects considered unit ventilators and several popular central station systems. They carefully compared the performance characteristics, maintenance requirements, first cost and operating cost of each method. Their conclusion: The new Carrier Reheat Weathermaster* System provides the highest quality automatic heating and ventilation currently available to schools. It is the easiest to convert to complete year-round air conditioning. It costs 10% less, installed, than the next best method. And it costs less to operate and to maintain than other automatic systems.

The eight important advantages of the Reheat Weathermaster System which led to these conclusions are listed on the opposite page. They are unique because these Carrier units are the only room terminals which combine the performance benefits of the induction principle with either high or low velocity air distribution and the superiorities inherent in all central station systems.

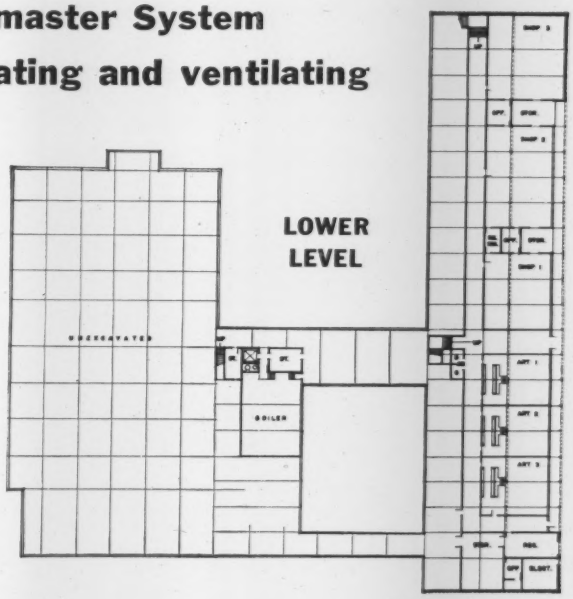
If you are designing a new school, it should be well worth your while to look into the Carrier Reheat Weathermaster System—either for heating and ventilation only, or with an eye to future air conditioning. The nearby Carrier office will be glad to give you complete facts on this advanced system. Or write to Carrier Air Conditioning Company, Syracuse 1, N.Y.

*Reg. U.S. Pat. Off.





Only the Carrier Reheat Weathermaster System offers these 8 advantages for heating and ventilating



1 Positive ventilation and air circulation under all conditions and seasons for improved odor dilution. Constant air volume from units.

2 Quieter operation—no fans or other moving equipment in classrooms, with all powered equipment located in machine room for easy servicing.

3 Superior air filtering at central station—minimum filter maintenance.

4 No costly wall openings, subject to rain and wind leakage, required in classrooms for ventilation air.

5 No operation of fans required for night and week-end heating, with gravity heating handling the load.

6 Individual temperature control in every room solves zoning problems; air damper assures easy initial system balancing, requires no adjustments thereafter.

7 Valuable classroom floor and wall space is saved by the compact units; cabinet only eight inches deep.

8 Easily and economically converts to full-year-round air conditioning at any future date with simple addition of packaged water chilling machine in central apparatus room. No revision of classroom units, controls or air ducts required. Condensate drains not needed. Nominal conversion cost about 65c per sq. ft., or less.

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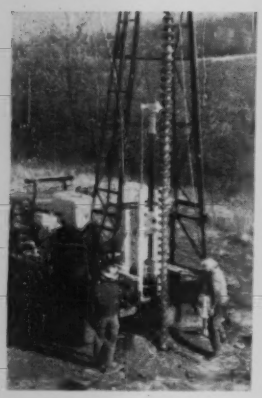

Acker SP handles 5 foot hollow-stem or conventional auger flights. Switches to roller rock, carbide, saw tooth or diamond bit coring. The SP handles angle or vertical holes, deep or shallow in any formation.

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Acker's SP is designed for heavy duty service. It has a four speed cathead hoist, built-in reverse and four speed transmission. It's completely self-contained and mounts on truck. Owners of the SP are reporting unprecedented results drilling and augering for soil samples, in hollow stem augering and geophysical and geological exploration.

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Reader Comment

Overadequate Aluminum

SIR—The Appomattox aluminum bridge (ENR June 8, p. 30) is most interesting, both in what it does and what it does not do.

Considering the fact that it includes an 8-in. concrete slab it would appear that the elimination of two of the five aluminum sections and the reinforcement of the slab to span between the remaining three would be an economical measure. These remaining units would have to be stronger of course but that simply means more material. There would be little, if any, more labor on them.

The 187,000 lb of structural steel seems an ample, even a generous, weight. Apparently it derives from the Bureau of Public Roads 1953 publication Standard Plans for Highway Bridge Structures, where a 100-ft span is shown carried by five 36-in. WF 300 lb beams and a 6-in. concrete slab composite with them. The Bureau's estimated weight for same is 184,500 lb.

However, the BPR publication also suggests, for a 100-ft span, four welded plate girders, 6 ft deep, weighing a total of 111,600 lb. In this Appomattox case the overall depth, 4 ft, 10 in., would require heavier flanges and more metal. But even so, a revised steel design should certainly be in order next time alternate bids are taken on these designs.

For whatever value the figures may have to anyone, the writer now has a 6-ft-deep, 120-ft steel delta girder span shortly going out for bids. There are two girders, 24-ft roadway, two wide curbs, 28-ft overall breadth, H20S16 loading for which the structural steel weight is 81,600 lb.

HOMER M. HADLEY
Consulting Engineer
Seattle, Wash.

Credit Due

SIR—Your story on erection problems on the 3-D radar tower in New Jersey (ENR June 15, p. 40) tells of the unusual heating and ventilating design required to keep the antenna at uniform temperature. You listed the firms involved in the project with the exception of the source of this part of the design. Guy B. Panero Engineers were the mechanical consultants for this project.

GUY ARTHUR PANERO
Guy B. Panero Engineers
New York, N. Y.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St.,

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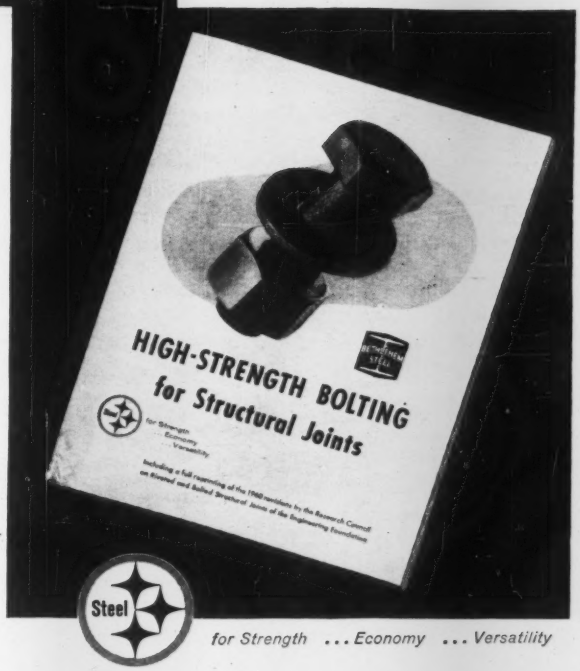

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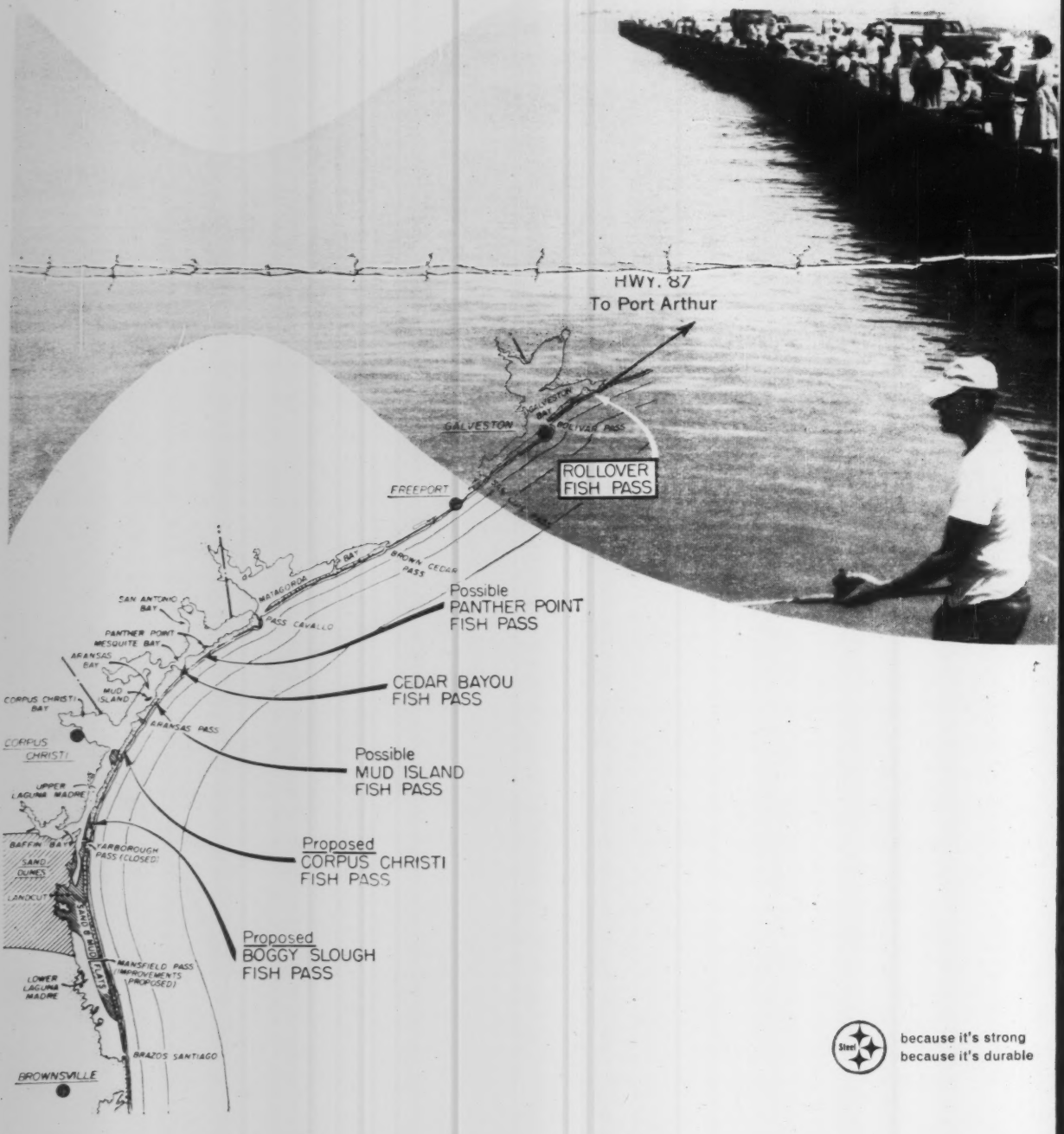
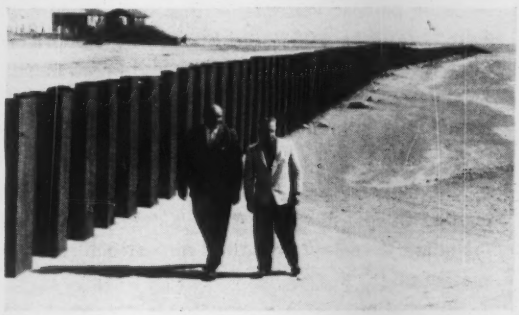
USS Steel Sheet Piling cuts off erosion



because it's strong
because it's durable

at Rollover Fish Pass

● Rollover Fish Pass is a narrow, man-made channel that runs through a barrier island off the coast at Galveston, Texas. It was dug several years ago by the Texas Game and Fish Commission to connect the Eastern Arm of Galveston Bay with the Gulf of Mexico as part of a long-range program to improve commercial and sport fishing in the bays of the Texas Coast. Artificial waterways like Rollover improve the salinity balance of the bays and open new spawning grounds. ● At first, Rollover Pass caused trouble. Powerful tidal currents eroded the sides and widened the channel causing damage to adjacent property and endangering bridges on State Highway 87. Remedial action taken consisted of driving steel sheet piling along the sides of the Pass to stop erosion. Two steel sheet pile sills were also driven across the pass to keep the channel from scouring. Over 1500 tons of USS steel sheet piling were used for the job. ● Joe Marks, Chief Engineer for the Texas Game and Fish Commission, said, "United States Steel sheet piling was selected because of its strength and economy. I fully expect this steel sheet piling to have a long and useful life." ● Today, Rollover Fish Pass is one of the most popular fishing spots in the area. As many as 5000 people have fished here in one day. And the Pass has attracted new businesses, too—restaurants and motels have sprung up nearby. Mr. Marks said, "The operation of the pass is highly successful and fishing results have been excellent." The success of Rollover Pass has prompted the Commission to move ahead on plans to excavate additional inlets through the barrier islands along the Texas Coast. ● If you need steel piling—steel sheet piling, pipe piles or H-Piles, call the nearest U. S. Steel Office, or contact United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.



Fred T. Hankey, Jr. and Joe Marks of the Texas Game and Fish Commission inspect steel piling installation at Rollover Pass.

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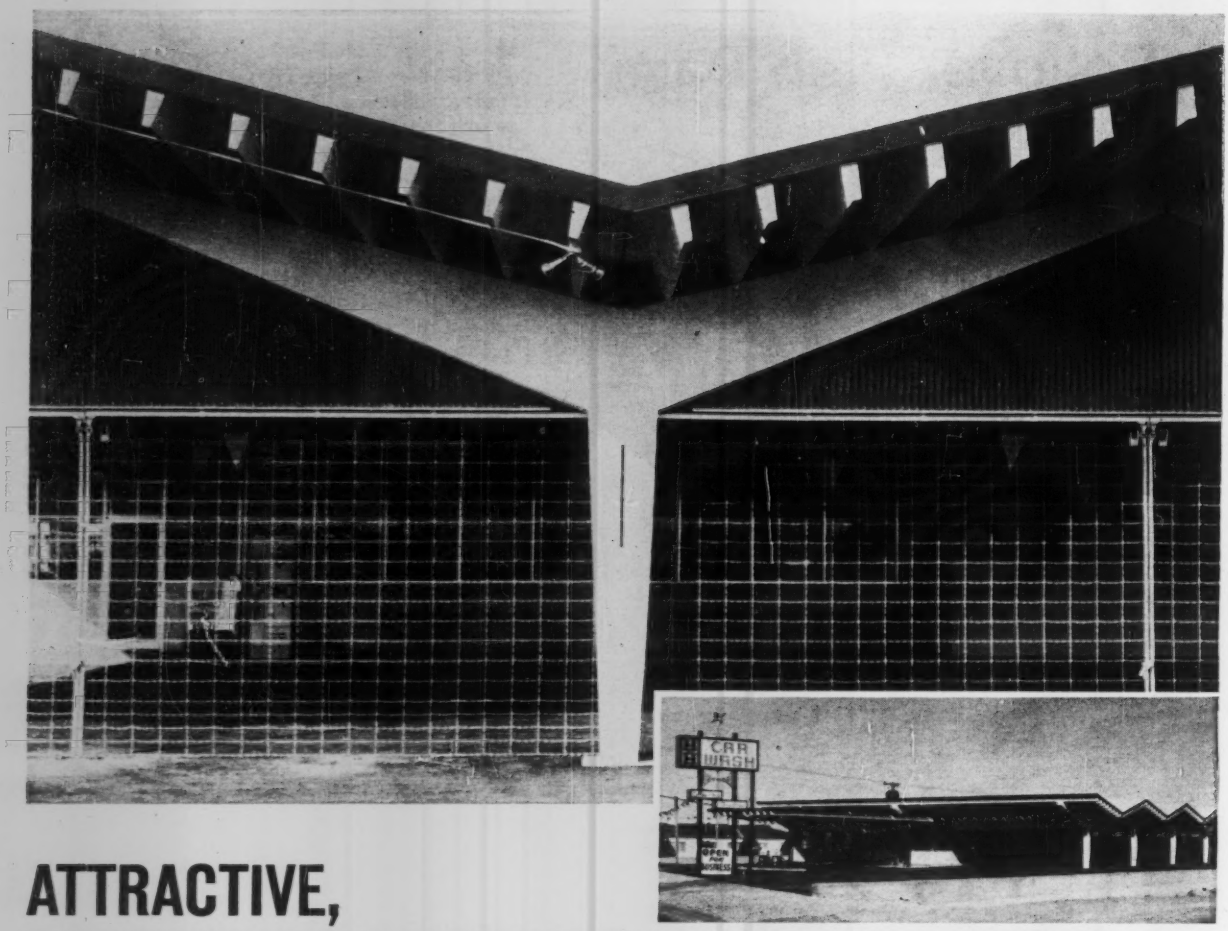

ATTRACTIVE, PRESTRESSED CONCRETE ARCHITECTURE

Another perfect example is this unusual structure in El Paso*. Built in 1961, the building is comprised of 4 ft. double T slabs prestressed with CF&I Prestressed Concrete Strand (Maximum span 60 ft.) with 10 ft. cantilevers at both ends, supported on 32 ft. span precast Y-frames. Construction is tied together with embedded plates welded at the joints. 23,000 sq. ft. of double T's and frames were erected in less than two days. Complete with equipment, including a restaurant, the entire structure cost approximately $6.00 per sq. ft.

So whether you are planning a car wash, warehouse, school, shopping center, office building, bridge, packing plant or any structure, check the advantages of prestressed concrete. It offers clear spans, speed of erection, resistance to corrosion, fireproof construction, attractive architecture and building economy.

And when you draw up your plans, specify CF&I Prestressed Concrete Strand manufactured to ASTM A-416 or CF&I Stress-Relieved Prestressed Concrete Wire made to ASTM A-421. Write for CF&I's file containing outstanding prestressed concrete project sheets.

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ENGINEERING NEWS-RECORD

Vol. 166, No. 26 June 29, 1961

Number of copies printed in this issue 87,601

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THE CONSTRUCTION WEEK

PAYOLA GOES TO JUSTICE—Testimony concerning $48,000 in payola and "grossly deficient" testing and inspection procedures on federally aided highway construction in New Mexico went to the Justice Department early this week. Seven state engineers and one federal employee allegedly received the graft from contractors (see p. 17). The scandal emerged from two weeks of hearings by the Blatnik subcommittee.

CPM GETS BIG PLAY—The American Association of Cost Engineers heard from proponents of the Critical Path Method last week that this method of scheduling projects (ENR Jan. 26, p. 25) works as well for small construction organizations as for large ones. Three contractors in the $5- to $10-million-a-year league have found it more efficient than traditional bar-chart scheduling.

KEMANO ROCKFALL CONFIRMED—Aluminum Co. of Canada found its Kemano power tunnel partially blocked by a rockfall as expected (ENR Mar. 9, p. 21). Alcan is pumping out the last few feet of water dammed up by the fallen rock. The company expects repairs to take seven to eight weeks. Alcan shut down its big Kitimat smelter for the repair job, but deliveries won't be affected.

MAIL EARLY—If you're bidding an Argentine construction job, mail your proposal in early—real early. The Argentine Customs is so slow in releasing parcels arriving by mail that bids arrive at government offices long after the deadline. This costs Argentina millions of dollars a year through non-receipt of possible low bids, says Buenos Aires Chamber of Commerce.

IMPORTANCE OF APPRENTICES—Peter T. Schoemann, president of the plumbers union, made a bread and butter issue out of apprenticeship training last week when he addressed the 79th Annual Convention of the National Association of Plumbing Contractors. Failure to produce enough journeymen, he suggested, hurts both the plumbing trades and contractors because it gives manufacturers a chance to move industrial union men into building trades work.

TOO HIGH AND OUT—All seven bids for excavation and construction of Cougar Dam powerhouse on Oregon's South Fork McKenzie River were rejected by Portland District of U.S. Corps of Engineers. Lowest bid of $1,365,594 was more than 25% above estimate (ENR June 22, p. 302). Highest was $1,711,792. The job will be advertised again in October.

SMALL CHANGE IS BIG MONEY—Rezoning of a four-foot-wide strip of land in Toronto, Ont., cleared the way for construction of an $8.8-million office building. All of the property but that 48 inches was zoned for commercial; the strip was residential.

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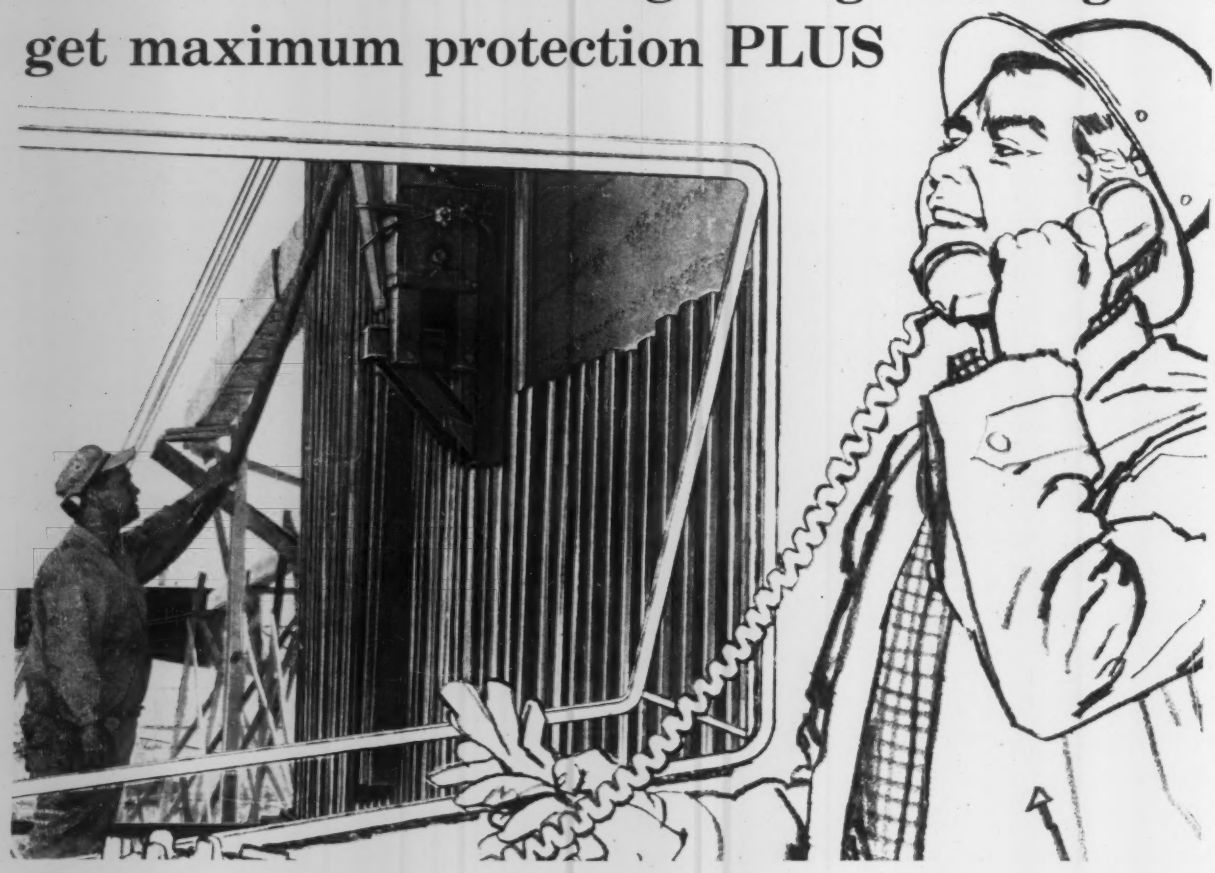

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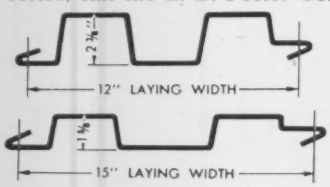

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WASHINGTON OBSERVER

- **Unions call foul in ICBM work probe**
- **Faith issue still delays school aid**
- **Urban Affairs Department nears vote**
- **Congress eyes university as contractor**

● **AFL-CIO construction union chiefs protest they didn't get a fair shake before the McClellan committee** that investigated lags in missile base construction.

"A one-sided investigation . . . opinions were given off the top of the head," charges C. J. Haggerty, head of the Building Trades Department. The McClellan hearings were temporarily called off the day before Mr. Haggerty was due to testify on labor's role in construction of missile base sites. Senator McClellan charged the unions were a major cause in the delay and high costs of the defense projects.

Mr. Haggerty accuses the Air Force of "ignorance and hysteria" in its complaints against craft union-contractor agreements at the missile sites providing for overtime and travel time pay. These agreements "are justifiable, very fair," he says. The Air Force has charged that agreements between the electrical workers and contractors at Cape Canaveral and Malmstrom Air Force Base in Montana provide excessive payments to the craft workers.

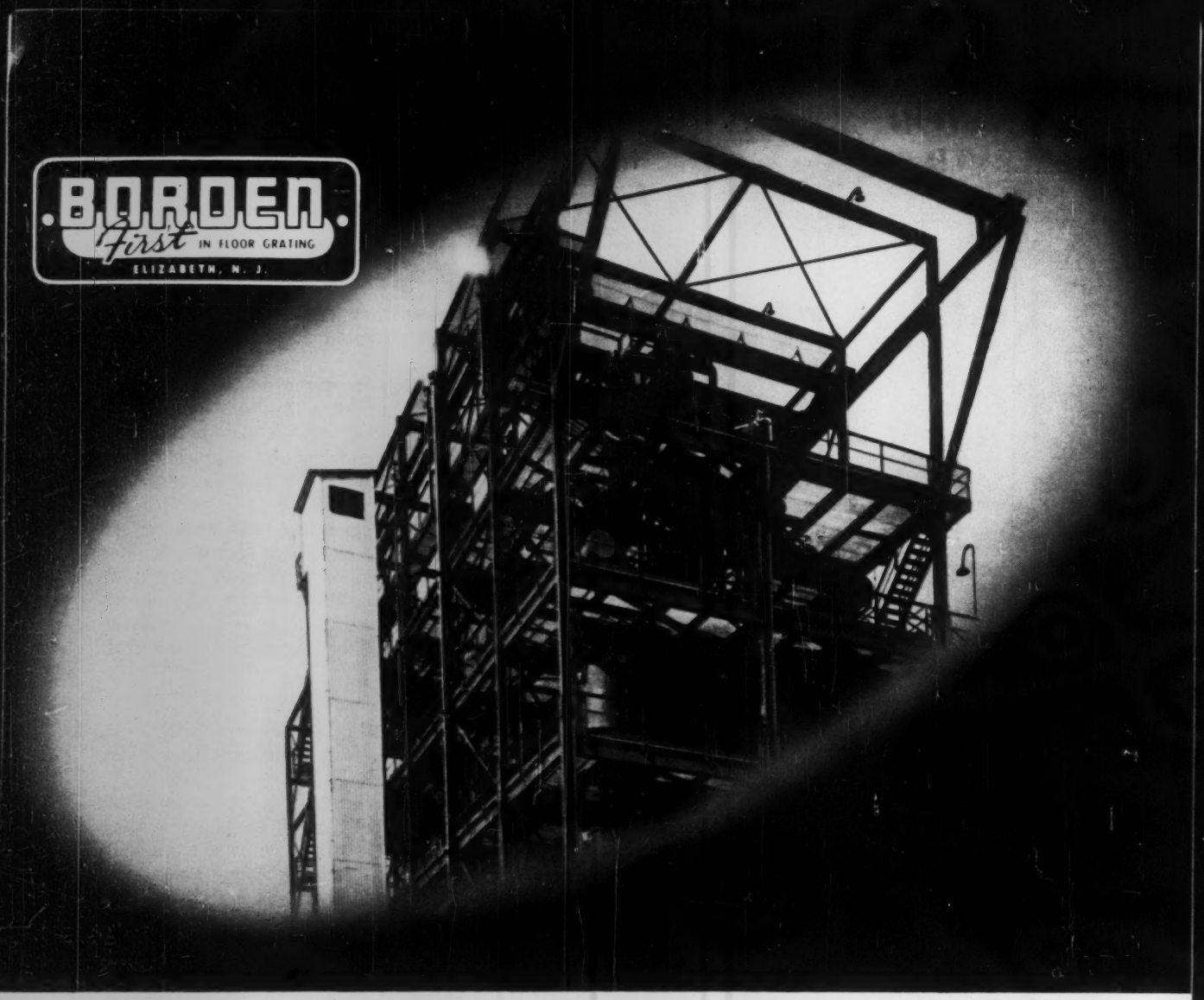
● **Federal aid for school construction is caught up on the religious issue.** Speaker Rayburn fears the legislation is dead; Administration officials are more optimistic.

Root of the trouble: The House Rules Committee insists upon acting on a public-school aid bill and a parochial-school aid bill at the same time. One would give $2.5 billion to public schools, the other would aid parochial schools by lending them money to build classrooms for science, language and mathematics. Those pushing aid to parochial schools led by majority leader John McCormack of Massachusetts will agree to support public-school aid in return for votes for parochial schools. What may kill the bill is that Southerners, who are only lukewarm on school aid in the first place, may say "no" to the parochial school bill and so lose support for the public school bill will go down the drain with it.

● **Legislation to create a Department of Urban Affairs and Housing moves toward a vote in Senate and House committees.** Hearings should be completed by the end of next week. Crucial to getting congressional approval is the question of who will head the new agency. The obvious choice is Robert Weaver, head of the Housing and Home Finance Agency. Some Southerners oppose the choice because Mr. Weaver is a Negro.

● **Congress will keep a sharp eye on how Stanford University manages construction of a two-mile-long tunnel** in which a linear electron accelerator will be installed. The project, just approved by the Joint Committee on Atomic Energy, is expected to be approved by Congress this session. It will be used for research in high-energy physics.

Some $50 million of the $114-million authorization is for construction of the tunnel. Stanford, as prime contractor, will subcontract the construction. And here is where the "watchdog" Joint Committee will be active. The committee says it has doubts about efficiency of the "long chain of command," and will want regular progress reports.



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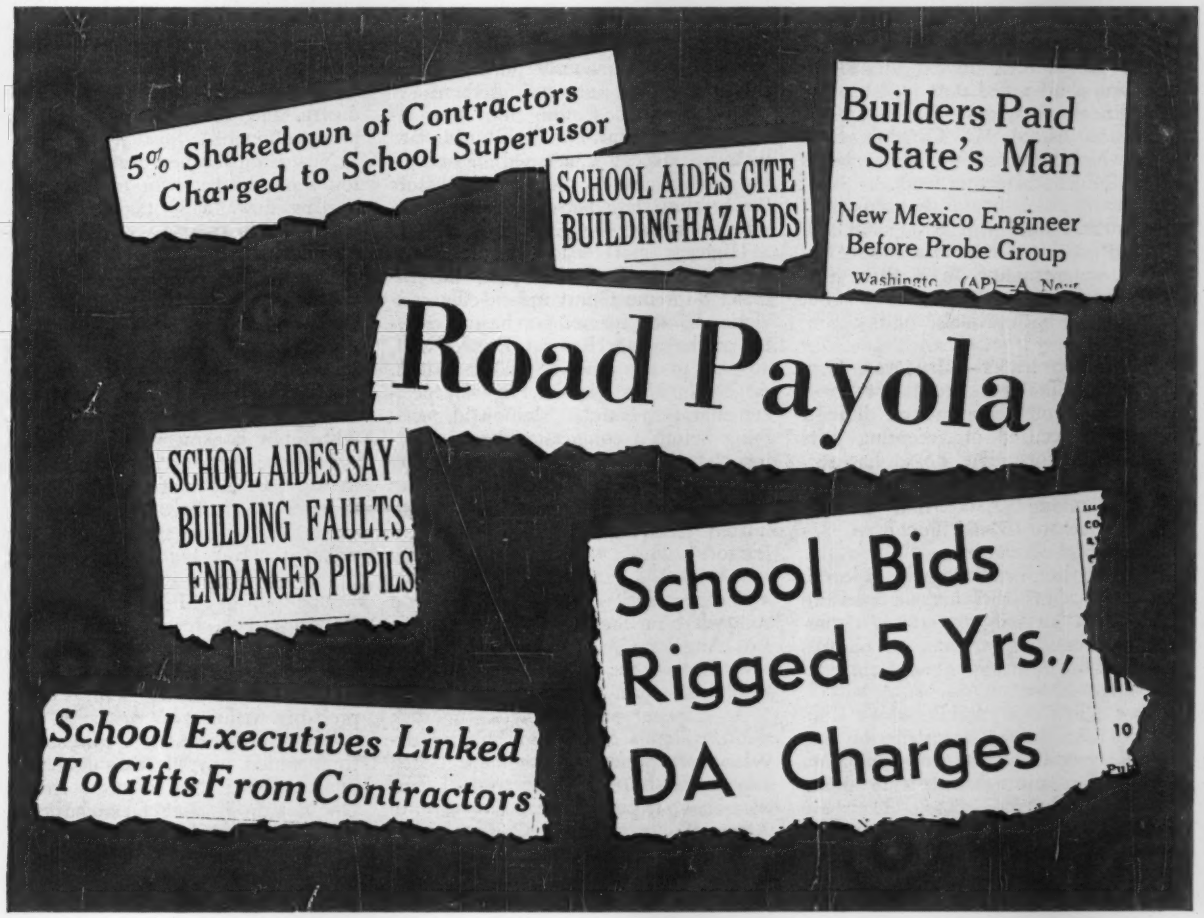

5% Shakedown of Contractors Charged to School Supervisor
SCHOOL AIDES CITE BUILDING HAZARDS
Builders Paid State's Man
New Mexico Engineer Before Probe Group
Road Payola
SCHOOL AIDES SAY BUILDING FAULTS ENDANGER PUPILS
School Bids Rigged 5 Yrs., DA Charges
School Executives Linked To Gifts From Contractors

New Scandals Taint Construction

New York City led the nation in construction industry scandals last week, but not without competition from other regions. Chief competitor was Philadelphia, where the bright image of a 10-year-old reform administration was fading.

In New York, city and state investigators are digging into a webwork of wholesale graft, political shakedowns, conflict of interest, rigged bids and payola that allegedly left the city with shoddy school buildings and excessive contractor bills.

The scandals evoked some drastic proposals. As a new weapon against shoddy construction, New York is considering lawsuits against builders whose schools are not built to specification. And Mayor Robert F. Wagner proposed abolition of the Board of Education's construction and maintenance work.

Under Mayor Wagner's plan a new city charter, now under study, would create a city Department of Engineering and Construction. It would assume the responsibility of supervising construction and maintaining all city buildings, including schools.

• **Fading image**—In Philadelphia, multiplying revelations of graft and payola culminated in petitions for a grand jury investigation. The petitions charge "widespread crime and corruption, conspiracy, extortion, fraud, payola and corrupt solicitations."

Earlier this month Mayor Richardson Dilworth fired several city employees, including the chief of the Bureau of Architecture and Engineering, Harold V. Varani, and two officials in the city's Department of Public Property. A grand jury is investigating the three former city employees along with contractor Eli G. Travis, who allegedly distributed $100,000 in payola to city employees, and a retired vice president of the Philadelphia Transportation Co.

The city is suing the Philadelphia Transit Co. for recovery of charges for repair work on an elevated transit line. Mr. Travis was the owner of a steel contracting company that had contracts for $1 million in repairs to the elevated line.

• **Falling blocks**—Public hearings held by the New York State Investigation Commission brought out testimony on defective construction involving everything from warped doors, which stuck and trapped students in classrooms, to masonry falling off auditorium walls and crashing into the seats below.

A custodial engineer at the Bronx

site of the falling blocks testified that he found 1,200 flaws in the $3.6-million school after it opened in 1958. Another alleged defect: openings in walls pierced with steam and water pipes stuffed with newspapers and plastered over with cement mortar. Vincent J. Caristo, president of the Caristo Construction Corp., the builder, denied the allegations and condemned state investigators as politically inspired. The Board of Education barred Mr. Caristo's company, which built half the city's schools since 1946, from further work.

A city official estimates that repairs on the Bronx school will cost $250,000. He also estimated cost of repairing defective waterproofing in a three-year-old school in Queens at $750,000. Caristo built both schools.

• **Follow the leader**—Fifty-seven New York City school board employees (over half of the total construction division force) are accused of accepting gifts from contractors. The board has suspended one inspector who reportedly admitted taking $2,300 from mechanical contractors (ENR June 8, p. 22) over a period of years.

The inspector, Francis X. Ficarra, affirmed that he "took his cue from the top" when he saw contractors' representatives handing envelopes to officials at school board headquarters during the Christmas season.

Two officials in the Board of Education's Bureau of Construction admitted soliciting political campaign funds from private architects doing business with the board. They are William H. Correale, former director of the construction unit; and Michale L. Radoslovich, presently Director of Architecture. Mr. Correale is also under investigation by the city for accepting gifts from contractors.

The state commission also charged another school board employee with receiving a 5% commission from contractors for handling and expediting contract revisions.

It was also disclosed that Joseph R. Weiss, deputy school superintendent in charge of the school board's construction activities for the past two years, had served as a consultant both to the school board and to the architectural engineering firm of Tippetts-Abbett-McCarthy-Stratton from June 1957 to April 1958.

The suspicion of rigged bids on both new school and repair contracts entered the picture at the end of last week. The Queens County District Attorney reportedly had received information uncovered by city investigators.

• **Praise for payola**—In Florida, where a political controversy still boiled over payola scandals involving state highway inspectors (ENR Mar. 2, p. 24), a letter-to-the-editor writer praised payola in a Miami newspaper as a means of speeding highway construction. Citing his experience building highways, the writer explained that payola was the only way he could induce inspectors to stop obstructing the work.

He recommended extension of the practice into previously pure areas of the state to get jobs rolling there.

Investigations earlier this year resulted in suspensions of Florida state highway inspectors accused of accepting payola and barring of contractors for bribing state personnel and doing inferior work.

Highway graft made the headlines farther west. In Indianapolis the Indiana Supreme Court upheld the conviction of the former purchasing director of the State Highway Department, accused of accepting $7,000 in bribes. A veteran New Mexico Highway project engineer, Rufe J. McDonald, testifying before a congressional investigating committee, admitted taking $4,600 payola from two contractors. Another project engineer, Herman L. Vick, admitted receiving $2,000 from a contractor.

• **Watered rock**—The pattern changed somewhat in the Far West, where a Los Angeles County Grand Jury was investigating the possibility of a more traditional form of chiseling.

A surprise weight check on rock delivered to a $60-million harbor development project at Redondo Beach revealed a shortage of 26 tons of rock in a six-hour period, according to City Attorney Arnold M. Cowan. City officials suspect that the city may have been overcharged thousands of dollars in the 50,000 tons of rock now in place.

Contractor R. R. Hensler, Inc., of Redondo Beach, has a $3-million contract for preliminary construction on the harbor project. Mr. Cowan did not accuse the Hensler organization of responsibility for the weight shortage. Mr. Hensler speculated that his truck drivers may have dumped part of their cargo after weighing at the quarry to meet highway load requirements.

• **Oh give me land**—In the Northeast, inflated real estate appraisals in Massachusetts (ENR Apr. 12, p. 17) hit the news again when the federal government released $9-million of the state's $12-million federal highway money withheld since January 1960. Charges by a House public works subcommittee that state appraisers were overevaluating land led to delay in delivery of the funds.

The remaining $3 million will be paid on a parcel by parcel basis after an independent firm has checked on the state's valuations on property taken for federally aided highway projects.

Housing Bill:

The huge omnibus housing bill pushed through Congress is the biggest housing measure in history, and the first four-year housing program enacted by any Congress. It represents an enormous boon to the building industry, and a big victory for the Administration.

New Frontiersmen are patting themselves on the back for their success in beating down a series of Republican amendments aimed at gutting the bill. Democratic ranks held firm, sweeping it through the House 235 to 178 and the Senate 64-25, in substantially the form President Kennedy sought.

Democrats estimate the new housing program will cost $4.9 billion in grants and loans over the next four years; Republicans say $9 billion. The 100,000 public housing units included represent one-sixth of all public housing in the past 24 years; the amount authorized for college housing is 70% of the total for the past 11 years; urban renewal funds approved equal the amount spent in the past 12 years.

The bill passed by the House differs in only a few respects from the Senate-passed version. A Senate-House conference will iron out the differences and send the measure to the President, probably within two weeks.

The GOP-Southern Democrat coalition, which usually trims down housing legislation, fell to pieces this year. One reason is that Democratic managers of the bill added two "sweeteners" for the Southerners: a big boost in loans for community facilities in smaller cities, much of which will go to the South, and an expansion of the farm home loan program.

Another reason was fierce lobbying by the National Association of Home Builders, the American Municipal Association, labor unions and the Administration, which dangled airports and dams freely before hesitant Southerners and Westerners. The opposition was led by the National Association of Real Estate Boards and banking interests.

The major defeat for the Administration was modification of the proposed no-down-payment, 40-year FHA loan program for houses costing up to $15,000. Opponents effectively argued that at the end of 10 years the purchaser of a $15,000 house would have only a $350 equity and probably owe more than the house was worth. They argued the provision threatened the sound business basis of the whole federal housing program. The Administration quickly backed down.

The Senate version keeps the 40-year loan feature, but requires a down

$5-Billion Boon for Builders

payment of $555 plus closing costs. The House version requires a 3% down payment, or $450 including some closing costs, with a 35-year mortgage.

The House also added a significant feature not included in the Senate bill; more liberal terms for all FHA-insured loans on single-family units. It extends them from the present 30 years to 40, and raises the maximum insurable mortgage from $22,500 to $27,500. The conference will probably compromise at $25,000 for 35 years.

Other features of the bill passed by the House, with Senate differences, are:

• **Urban renewal**—$2 billion in new spending authority, expected to carry the program for four years. (The Senate has approved $2.5 billion, and earmarked $50 million of it for demonstration projects in mass transportation.) Present urban renewal funds are all earmarked for communities under 50,000, the federal share of the cost would be raised from two-thirds to three-fourths.

• **College housing**—$1.2 billion ($300 million each year for four years) in long-term loans. The Senate has approved $100 million for the current fiscal year and $250 million for each of the next five years.

• **Community facilities**—$500 million in low-interest (currently 3.5%) loans for facilities in communities under 50,000 population and up to 150,000 persons in depressed areas. The Administration had asked only $50 million, the amount approved by the Senate. The full $500 million probably will be approved in the end. The Senate also added $100 million for loans to mass transportation systems.

• **Home improvement loans**—Twenty-year loans of up to $10,000, at not more than 6% interest. A multiple-family unit could get that much per unit. This is designed largely for older homes on the fringes of urban renewal areas, and could prevent further decay of in-city residential areas. The present program limits home improvement loans to $3,500 for three years, and interest rates run as high as 9.5%. The committee estimates that this could spur $4 billion to $5 billion worth of construction activity in the next five years.

• **Experimental housing**—A limited program enabling FHA to insure loans on houses containing new materials and techniques. Among the ideas described by housing officials: a stressed-skin sandwich panel with polystyrene core; nylon tubing for plumbing; plastic woven wall coverings; particle boards with veneer finishes for floors, walls and cabinets.

• **Housing for the elderly**—The present $50-million authorization, already exhausted by the applications in hand, would be expanded to $100 million. Cooperatives would be eligible; currently only non-profit corporations are considered eligible.

• **Public housing**—100,000 more public housing units. Most of this would go for low-rent housing to persons displaced by urban renewal projects, and may carry the program for three or four years.

• **Low-rent housing**—Loans at subsidized low-interest rates will be made to non-profit corporations to build low-rent housing projects costing up to $12 million. Coupled with this is an additional $750 million for Federal National Mortgage Association (Fannie Mae), which will be buying these mortgages in the secondary market.

• **General insurance authorization**—Removes the dollar limit on FHA's insurance authority and instead authorizes FHA insurance programs until Oct. 1, 1965. Permits short-term loans to builders on the security of pledged FHA and VA mortgages so that a builder's capital is not tied up during sale of houses, a change long sought by the homebuilding industry.

• **Open spaces**—$100 million to subsidize 20 to 30% of the cost of acquiring park land in and around urban areas. The Senate killed this, but will probably agree to its restoration.

• **Farm housing**—$207 million to extend the loan program another four years.

Fifth Month: Still No Code

Fast-growing Phoenix, Ariz., which has been operating without a housing code since late February, apparently will not get one in the foreseeable future. There has been no move to supplant the rescinded code.

Last February 28, opponents of a housing code, enacted only two years before, forced the City Council to repeal the ordnance by presenting the Council with a petition containing 10,477 signatures. The protests, which charged that the housing code was "communistic, socialistic and police state," focused on the provision granting city housing inspectors mandatory access to dwelling units. Refusal to admit an inspector was punishable by fine (see editorial, p. 60).

The code also banned outhouses and unvented gas heaters, required hot and cold running water in lavatories, baths and sinks, and specified a minimum of 150 sq ft per occupant and 70 sq ft of sleeping space per occupant.

The City Council, which also abolished the Urban Renewal Department in response to the petitioners' protests, could have put the question on a special election. The $20,000 expense of running the election was one reason that the special election was not held.

In 1959 the rescinded code superseded an original 1956 Phoenix housing code. A 36-member citizens' committee worked eight months preparing the code in response to a federal request to raise housing standards.

Nearly 20,000 of Phoenix's 145,000 dwelling units recorded in the 1960 Census are classified either as "deteriorating" or "dilapidated." Since the census, the city's slums now have increased following the annexation of some outlying low-income areas around Phoenix.

One leader of the drive to rescind the housing code, Aubrey I. Moore, a Baptist minister, condemned the access power of the inspectors as "the kind of inroad that had led countries down the road to socialism." M. T. Phelps, a former Arizona Supreme Court Justice, called the housing code "just another part of a plan by the federal government to gain control of every state and the cities within them."

Another leader of the code repeal movement, Samuel Levitin, secretary of the 1,600-member Phoenix Property Owners Association, protested a change of floor area requirements pertaining to kitchenette apartments. These provisions, he argued, would affect many of the city's motels.

Builder Ralph Staggs, a member of the city committee studying the possibility of the city sponsoring its own redevelopment program, criticized the City Council's action abolishing the code and the Department of Urban Renewal. Without a housing code, the city will have an accelerated growth of slums, he predicted.

The code repeal was tied in with a rejection of the federal government's urban renewal program by political conservatives. Last winter Mayor Sam Mardian answered President Kennedy's request for a general step-up for urban renewal projects by replying that Phoenix intended to handle its own slum clearance and low-cost housing.

So far, the "self-aid" program proposed as an alternative to federal-aided public housing has produced little or nothing. Local builders maintain that high land costs make low-rental housing projects unprofitable.

Congress OK's More Money for Highways

Congress this week gave final approval to a massive infusion of new money into the federal-aid highway program. Its action will go a long way toward insuring the financial stability of the roadbuilding industry for the next 11 years.

The bill that finally emerged will provide close to $9.65 billion in new revenue. This will permit completion of the 41,000-mile Interstate System as scheduled in 1972, wiping out the threat of a stretchout or cutback that had been hanging over the program because of insufficient money.

It also authorizes an increase in federal allotments for the ABC systems of primary, secondary and urban highways. These will go up by $25 million each two years starting in 1964 until the $1-billion level is reached and maintained.

The legislation, worked out by a conference committee, is a compromise between the original $9.8-billion bill approved by the House and the $9.4-billion measure passed by the Senate.

The final figure is only $150 million below the amount first sought by President Kennedy and agreed to by the House. This reduction is acceptable to the President. In fact, the Administration requested it at the last minute. It is not of sufficient size to affect the highway program seriously and it may be offset eventually by higher-than-expected revenue from highway-user taxes.

The new revenue will be provided by continuing the federal gasoline and diesel fuel tax at 4 cents a gallon, by increasing taxes on tires, tubes, tread rubber, and the gross weight of heavy trucks, and by diverting to the Highway Trust Fund the portion of excise taxes on new trucks, parts and accessories that now flows into the general treasury.

President Kennedy originally wanted all of the new revenue to come from higher taxes on highway users. He opposed any diversion of money from the general treasury because it adds to the over-all budget deficit. The House, however, trimmed down the taxes on heavy trucks and voted a diversion of approximately $150 million annually.

The Senate went along with the House bill, except that it postponed the diversion for one year at the Administration's request. The Senate also trimmed down the tax increase on tread rubber and voted a 1% refund to service station operators for taxes paid on gasoline lost through evaporation and "shrinkage." The net effect of the Senate's action was to reduce the revenue approved by the House by $400 million through Sept. 30, 1972.

The conference committee restored all of this except the $150 million lost by postponing for one year the diversion of general treasury money to highway use. Both Senate and House went along with the committee's action.

The final bill also retained a provision in the Senate measure extending for two years the period during which states may qualify for highway fund bonuses by agreeing to billboard controls on the Interstate System.

The first effect of the new money will be felt in August when the Department of Commerce announces apportionments to the states for the fiscal year starting July 1, 1962. These will go up from $2.2 billion to $2.4 billion. The allotment for the year starting this July 1, $2.2 billion, already has been made and will not be affected.

U.S.-Built Cambodian Highway Falls

Congressional investigators charge that a 130-mile highway built by the U.S. in the newly independent southeast Asian nation of Cambodia is falling apart.

The State Department is trying to pinpoint responsibility and to determine whether suit should be brought against the contractor, A. L. Dougherty of Hammond, Ind., and the consulting engineer Michael Baker Engineering Co. of Rochester, Pa. (Michael Baker told ENR that he had complied fully with the terms of his contract, denied fully being deficient in any manner.)

The road, completed in July 1959, runs from the capital city of Phnom Penh to the seaport of Sihanoukville on the Gulf of Siam. Nearly 70% of it may have to be rebuilt. Its original cost was to have been $15 million; the final cost, which has not yet been determined, may be twice that.

A House subcommittee investigating waste in the foreign-aid program has been looking into the road project for the past three years. Chairman Porter W. Hardy cites the highway as an example of why President Kennedy is going to have trouble getting Congress to give him more long-range authority for foreign-aid projects.

The highway, according to Representative Hardy, was the "number one political impact project" by the U.S. in Cambodia and was "to project the image of the United States," providing "the yardstick by which our ability and know-how could be measured."

The subcommittee first turned up evidence of trouble during an earlier investigation when it found that the contractor and the engineering firm had feuded. Charges and counter charges alleged that the contractor ignored specifications in the base course construction and that the engineer had failed to provide the contractor with density tests.

Eventually, the contractor and engineer, with the blessing of the International Cooperation Administration, which runs the foreign-aid program, reached a gentleman's agreement to stop making charges against each other in formal correspondence, said the Congressman.

This, said Representative Hardy, "had the effect of keeping ICA uninformed on day to day operating deficiencies and deviations from specifications" and set the stage for laxness in supervision.

Representative Hardy's subcommittee called ICA's attention to its concern over the adequacy of the construction in 1958. But ICA replied that "in the opinion of the engineers, this road will be capable for some time to come of meeting the requirements of the heavy truck traffic expected and of weathering the heavy rainfall during the annual five-month monsoon period."

The subcommittee began looking into the project again earlier this year when ICA, in its request for funds for the fiscal year starting July 1, said additional money might be necessary to repair damage to the Cambodian highway caused by slides and settling that had occurred during the heavy rainy season. ICA insisted the damage represented a normal shakedown problem common to all new highways.

Representative Hardy said, however, that the Cambodian government had agreed to handle normal repairs to the road and the fact that ICA was undertaking to make the repairs "suggested the damage was in all probability related more to basic defects in construction and engineering than to rains."

When the subcommittee called public hearings on the matter last week, ICA acknowledged that portions of the road appeared to be basically faulty. Representative Hardy's group has postponed further action, pending the results of the State Department's investigation.

Seattle Monorail to Nest In These Concrete Trees

A row of T-shaped concrete pylons sprouted along the middle of Seattle's Fifth Avenue last week, the first monorail structures ever to appear in the streets of an American city.

The 54-ton pylons will support two concrete rails on which monorail trains will shuttle between downtown Seattle and the city's Century 21 Exposition in approximately 96 seconds (ENR Jan. 5, p. 25).

Cast in place, the reinforced concrete pylons will stand at 85-ft intervals on the straightaway and at 60-ft intervals on curves. Their average height will be 21 ft. The pylons measure 4 x 4 ft at the base.

The precast rails on which the monorail trains will ride will be 3 ft wide and 5 ft deep. Lightweight trains mounted on rubber tires will straddle these rails. Wheels that are mounted at right angles to the sides of the rails will provide guidance and stabilization for the four-car trains.

The Howard S. Wright Construction Co. of Seattle has a subcontract for the rails and terminals from Alweg Transit Systems of Washington State, a subsidiary of the Alweg Corp. of Sweden, designers and builders of the $4.2-million monorail system. Wright began work on the project in April. The construction of the mile-long monorail system is scheduled for completion in November.

Concrete Frames Beat Out Steel

Concrete has been bid low for the third successive time on alternate designs prepared for the New York City Housing Authority. In these three cases, buildings with concrete frames cost nearly 10% less than those with steel frames.

The most recent competition was for the Simkhovitch Housing Project in Manhattan. Five contractors submitted bids May 16 on alternate design in steel and concrete for six 21-story apartment houses. Each priced the concrete design lower than steel.

Joseph P. Blitz was low with a bid of $7,178,000. His price for steel-framed buildings was exactly $2 million higher. S. Silberblatt, second low bidder on concrete with a tender only $4,000 higher than Blitz', bid low on steel—$7,882,000. Thus the lowest price for steel-framed buildings was $704,000 more than for concrete.

Frederic P. Wiedersum Associates were the architects and Wiesenfeld, Hayward & Leon, the engineers for the Simkhovitch project. Both are New York City firms.

Last January, the Housing Authority took bids for four 21-story apartment houses comprising the Borgia Butler Housing Project in the Bronx. Six contractors bid—all lower for concrete than for steel.

Terminal Construction Co. was low bidder at $8,107,000. Again, S. Silberblatt was second low bidder on concrete and low bidder on steel, with a tender of $8,844,540. Here, the concrete-framed buildings were $737,540 less than the steel-framed ones.

The Housing Authority had a similar experience in April 1959, with alternate designs for the Woodrow Wilson Housing Project in Manhattan. Seven contractors priced the three 21-story buildings lower with concrete frames than with steel by $313,180 or 8.6%.

Several factors favor concrete construction in New York City: Designers have developed economical designs—flat plates with considerable standardization of columns and bays. Ready-mix concrete generally can be delivered when needed in required quantities. Building heights and widths permit low-cost concrete placement from bucket by truck cranes.

Bids are taken for several buildings at a time, permitting repetitive operations and many re-uses of forms and shoring. Undersides of floors are painted to serve as ceilings, eliminating the plaster ceilings required with steel framing.

Also noteworthy is the fact that the huge long-time housing program in New York City has led many contractors to develop special skill with concrete framing. The same names appear repeatedly in bidder lists. The contractors in the bidding on alternate designs in steel and concrete bid on the steel because they were required to. But in all cases, their prices for concrete were considerably less than for steel.

Sewer Shortage Stops Building

A major battle may develop over a recent order from the Michigan State Health Department barring issuance of building permits in 22 Wayne County communities outside Detroit.

The county's overburdened sewage disposal system forced the ban, which affects housing, factories and commercial structures. State Health Commissioner Dr. Albert E. Heustis says the overflowing system could spawn disease epidemics in the communities where raw sewage is overflowing into open ditches and gutters.

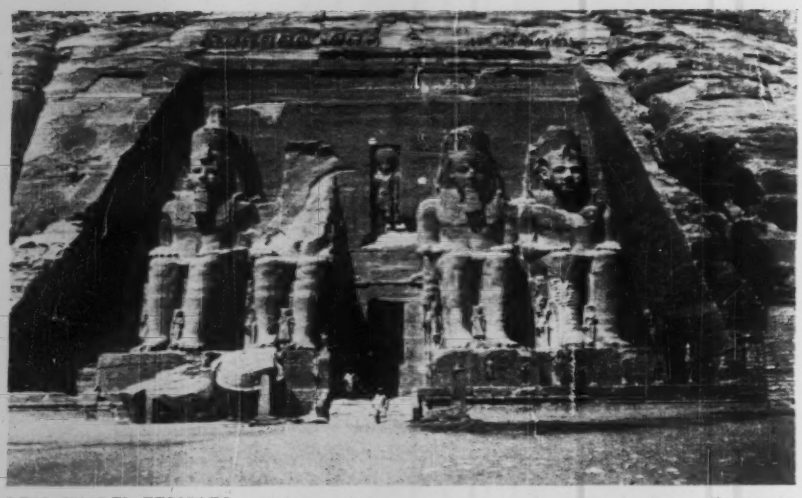
But the concerted scream from the construction industry stiffened the back of Wayne County Drain Commissioner Henry Herrick. "I've filed my letter from the State Health Department in the wastebasket," he said. He described the order as "illegal, capricious and arbitrary," and urged the 22 affected communities to continue issuing building permits.

Mr. Herrick, builders and labor spokesman accuse the state of using pressure tactics to force the communities to sign up for a planned $35-million sewer expansion program.

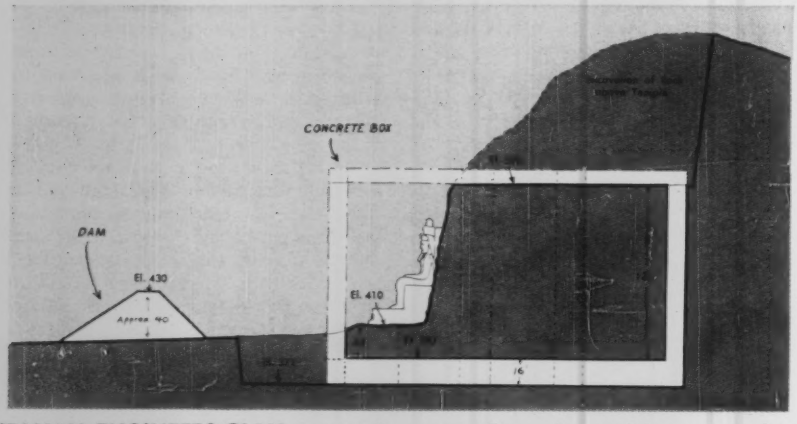
So far, backers of the system can't obtain commitments from all 22, and a refusal by one can sink the entire program. Six have signed, but getting the other 16 will be difficult. Their problem is summed up by Dearborn Township Supervisor John L. Canfield this way: "Our share of the cost would be $100,000 a year for 40 years; our tax revenue is only $153,000 a year."

But there is little denial of need. In Wyandotte, the sewage disposal plant was designed for 10 million gallons daily, but is operating at more than 17 million gallons. In Trenton, the system is operating at nearly double its capacity.

Estimates of industrial and commercial construction that may be stalled by the ban are unavailable. But residential builders say that in a normal year, about 8,000 new houses are built in the affected communities. This represents a minimum of $80 million in construction volume threatened by the ban.



ABU SIMBEL TEMPLES will be saved from permanent submersion in Aswan Reservoir.



ITALIAN ENGINEERS PLAN to cut it from surrounding rock, wrap it in a concrete box and lift it 200 ft. Some 300 hydraulic jacks will take seven years on the monumental lift.

Monument to Save a Monument

The United Arab Republic has decided to chisel out and raise the ancient Abu Simbel Temples instead of encircling them with a dam to prevent flooding by Aswan Reservoir.

The UAR government last week accepted the proposal of an Italian engineering group, Italconsult, Imprese Al L'Estero & Ing. Lodigiani, to cut the sculptures loose from the surrounding rock and jack them up some 200 ft, permanently above water level. Their present position will be submerged by the reservoir, scheduled to start building up behind Aswan Dam in the late 1960s.

The temples were carved out of a rocky cliff on the bank of the Nile more than 3,000 years ago as tributes to the great ego of Egypt's ancient King Ramses and his favorite wife Nefertari.

Four statues of the king—each 65 ft tall—line the facade of the great temple. Eight other larger-than-life likenesses line the interior walls of the huge wall. Drawings carved into the walls tell of Ramses' military exploits. Farther inside in a sanctuary, Ramses sits above the gods. The entire monument is 200 ft deep and 108 ft tall. The massive rock structure weighs some 300,000 tons.

Nearby, the smaller temple to Nefertari is similarly decorated with tributes to Ramses.

Execution of the Italian scheme is as likely to be a testimony to modern engineering know-how as the monument itself is to ancient Egyptian civilization.

The engineers propose to cut the temples loose, encase them in reinforced concrete boxes and jack them about the height of a 17-story building. Rock above the temples will be removed (by a method other than blasting, of course) to create the shaft through which the temples will make their ascent.

A system of tunnels will be bored under the monuments in order to make way for the bottom of the protective concrete crating and for 300 hydraulic jacks.

During excavation under the temples, a fill-type dam about 40 ft high will keep the work site in the dry.

The monumental lift is expected to cost nearly $70 million. The United Nations Educational, Scientific and Cultural Organization, which has campaigned vigorously to save the relics, has already raised some $27 million in an international fund-raising appeal. The organization expects that the entire sum will be raised in the seven years it will take to complete the project.

Paris engineers Coyne & Bellier had previously suggested isolating the temples with an elliptical earth and rockfill dam about 230 ft high. This scheme was estimated to cost about $60 million initially plus $350,000 annually for maintenance of a pumping station to handle seepage. Late last year, a team of experts reported to UNESCO and to the Cairo government that this plan would not be feasible. Chief among the reasons for turning down the plan for the dam: There would be no certainty that moisture wouldn't attack the temples at an elevation some 196 ft below the level of Aswan Lake.

French Engineer Indicted In Malpasset Dam Failure

More thorough site exploration would have revealed the bad rock conditions under the left bank foundations that caused the failure of France's Malpasset Dam (ENR Dec. 10, 1959, p. 24).

This opinion of a group of experts led to the indictment last week of Jacques Dargeou, the Agriculture Department engineer who accepted the concrete arch dam from the contractor.

M. Dargeou, departmental chief engineer for rural public works when the dam was built, was indicted for involuntary homicide by negligence. Nearly 400 sleeping villagers died in the downstream town of Frejus when the 197-ft-high dam collapsed the night of Dec. 2, 1959.

Although the conclusions on which the examining magistrate based the indictment still remain secret, a report published in Paris indicates that the late Andre Coyne's engineering firm, Coyne & Bellier, designers of Malpasset, has not been completely absolved of responsibility.

Design of the dam itself was okayed by investigators last year (ENR Apr. 7, 1960, p. 25). The new report in Paris says the designers should have been aware that the rock underneath the foundations had not been adequately probed. Coyne & Bellier would not comment.

JFK Dedicates First Full-Scale Desalter

The Interior Department's Office of Saline Water last week started selling desalted seawater to the City of Freeport, Tex. From the White House, President Kennedy symbolically turned on OSW's Freeport plant, the first of five demonstration desalinization plants the agency is now building or planning to build at various locations around the nation.

The 1-million-gallon-a-day desalter at Freeport actually has been operating since early May, but the official dedication, complete with televised quaffing of the tasteless water, was held up several weeks.

OSW claims the $1.25-million seawater converter is turning out fresh water for $1.00 to $1.25 per thousand gallons. The government is selling part of the output to the city of 14,000 people for 30 cents a thousand gallons, the remainder to the nearby Dow Chemical Co. plant for 40 cents a thousand.

The five demonstration plants will each employ a different desalting process. Three will convert seawater, the other two will freshen brackish water. The Freeport plant uses long-tube vertical distillation. The federal government hopes that by careful study of the five units it will be able to determine which of the various methods of desalinization is most feasible for future high-capacity desalters.

Congress Asks for Study Of Inter-Park Parkway Link

A new national parkway may be built in the South linking a number of federal and state parks in four states.

Legislation before the Senate and House Interior committees would appropriate $175,000 for a survey to determine the practicability of the proposed road.

The bills, sponsored by Sen. John Sherman Cooper and Rep. Eugene Siler, both of Kentucky, propose a highway linking the Great Smoky Mountains National Park in North Carolina and Tennessee; the Cumberland Gap National Historical Park, which covers portions of Kentucky, Tennessee and Virginia; the Cumberland Falls State Park, Mammoth Cave National Park and the Abraham Lincoln National Historical Park, all in Kentucky. The road would then turn southward and join the Natchez Trace Parkway near Nashville, Tenn.

The Department of Interior has endorsed the bill in principle. It says the area may be suitable for a parkway but questions whether all of the points named in the legislation should be included. It asks for greater latitude in route selection.

Around the World . . .

• **The last ride**—A tank and a personnel carrier rolled off the road onto a parking lot this week to end the AASHO-Bureau of Public Roads Ottawa, Ill. road test. Much of the pavement will be rebuilt where necessary and incorporated into U. S. Interstate Highway 80.

• **Spanish speedway**—Private interests in Madrid plan to build a toll highway that would cut across Spain from Irun in the north on the Bay of Biscay to Algeciras in the extreme south on the Strait of Gibraltar. Recent legislation permits privately built and operated tollroads for the first time in Spanish history. This 875-mile route would cost $40 million.

• **Riverbed to roadbed**—Tokyo has drained its 100-year-old canal to make it part of Metropolitan Expressway Route No. 1. The former riverbed is now part of a highway that will connect downtown Tokyo with Haneda International Airport.

• **Big job, big stakes**—Since Kentucky's Turnpike Authority successfully marketed a bond issue worth $118 million last week to finance construction of a 127-mi tollroad in the western part of the state, portland cement and asphalt interests fought for favor in the choice of material. Construction is scheduled for the fall, and it's expected the portland cement-asphalt controversy will continue right up to the wire.

• **Yukon or bust**—The government of British Columbia has handed an ultimatum to Wenner-Gren Development Ltd.—Build or beat it. A year ago the company began token construction on a 700-mile Pacific Northern Railway from central B. C. to the Yukon border (ENR July 14, 1960, p. 32). Since then, nothing happened. B. C. officials ordered the Wenner-Gren group to offer evidence of intent to build by Mid-July or abandon their railroad construction plan.

• **Perini goes public**—Perini Corp. of Framingham, Mass., has sold 1,350,000 shares of its stock to the public at $12.25 per share. Taken by the underwriters were another 68,530 shares sold by certain Perini stockholders. Net proceeds to Perini Corp. after underwriting costs was slightly more than $15.2 million, which will be used to retire outstanding debt.

• **For safer landings**—The nation's first system of visual glide slope indictator lights went into use last week at La Guardia Airport in New York City. The system provides landing pilots with a visual means of flying a predetermined glide path. When the aircraft is on the proper path, the pilot sees two rows of lights (one red, one white) on each side of the runway. If the plane is too low, both rows show red; if too high, both show white.

Sewage Aid Up; Amount Unsettled

The Democrats have won their long battle to raise federal grants for community-sewage treatment plants. The opposition fell completely apart without the presidential leadership of past years.

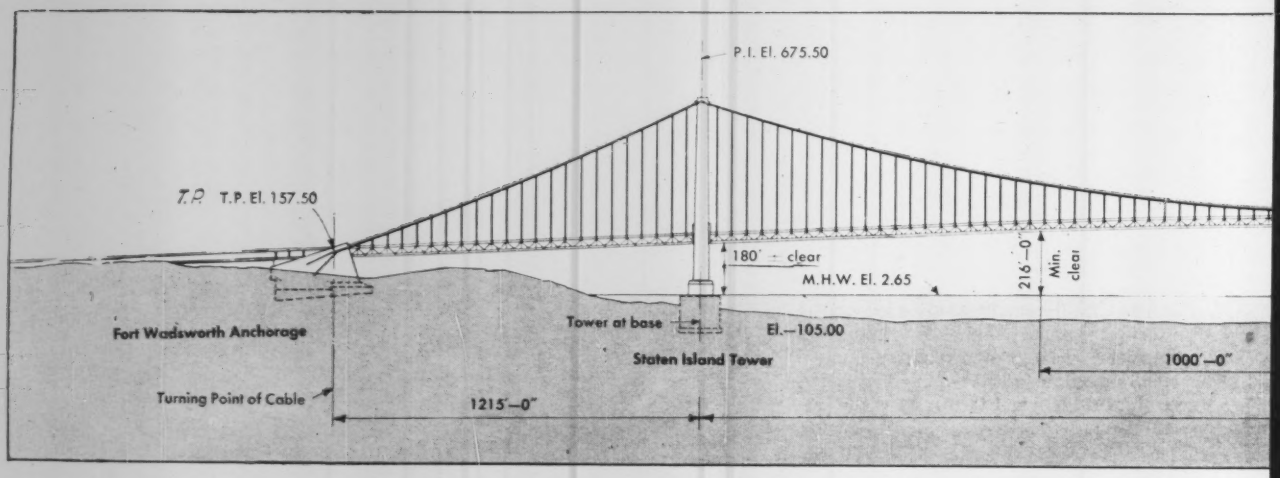
The Senate last week voted to increase the current authorization of $50 million a year to $100 million in graduated stages: $70 million for fiscal 1962, which starts July 1; $80 million for fiscal '63; $90 million for '64; and $100 million for '65 and '66. The measure was sponsored by Sen. Robert S. Kerr (D., Okla.) and passed on a voice vote encountering almost no opposition.

The House earlier approved doubling the program to $100 million a year immediately. A Senate-House conference will now compromise the difference and send a bill on to the President for signature.

The Administration regards the sewage treatment plant program as one of the most successful federal-local programs in existence. Since its inception in 1956, the federal government has granted $222.5 million on the construction of $1.3 billion worth of treatment plants. That construction volume is 62% above in the annual rate over the four-year period before the program started.

Government experts estimate it will take another $2 billion worth of treatment plants to clean up U. S. rivers and streams to a satisfactory degree.

President Eisenhower attempted to cut back or eliminate the program as a start toward returning responsibility to local governments. Democratic Congresses twice passed bills increasing the aid and Mr. Eisenhower vetoed them each time.



Everything About the Narrows

When New York City's Narrows Bridge is opened in 1965 it will be a truly remarkable structure. Among other things, it will contain the longest suspended span ever built. In the four main cables that will support its two decks will be enough wire to go five times around the world at the equator —with a piece left over long enough to reach from New York to Tokyo.

Its height, measured from the base of its eastern tower foundation to the tower top is just under that of the Eiffel Tower.

And it will be one of the most expensive single structures ever built by man: it will cost $325 million—almost ten times more than the present long span record holder, the Golden Gate Bridge, and the cost of new highways being built to it will exceed by many millions the combined initial cost of the Golden Gate Bridge and the George Washington Bridge (which currently has the third longest suspension span in the world).

At the present stage of construction the Narrows Bridge appears to the casual observer to be little more than widely scattered series of holes. But even the holes are remarkable—the excavation for the west anchorage is about a city block square, 145 ft deep, and on its completion will have required the movement of almost half a million cu yd of earth. Into it will go almost a quarter of a million cu yd of concrete.

The structure and its immediate approaches will be more than 2½ miles long. From anchorage to anchorage the distance will be 6,690 ft. The center span will be 4,260 ft—60 ft longer than that of the Golden Gate Bridge. (Present runner-up, Mackinac Bridge in Michigan, has a 3,800 ft span, third place George Washington Bridge has one of 3,500 ft.) Each of its side spans will be 1,215 ft long. Each of the four 35⅞-in.-dia cables will be 7,205 ft in length and will contain 26,108 wires.

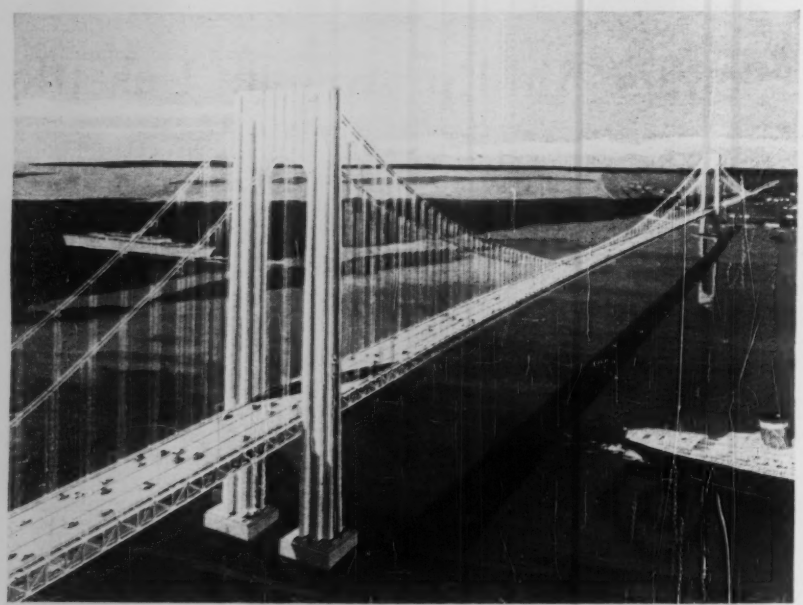
The total length of wire in the cables will be 142,500 miles.

Towers will rise 690 ft above the water. Tower foundations will go 105 ft below water on the Staten Island side, 170 ft below water on the Brooklyn side.

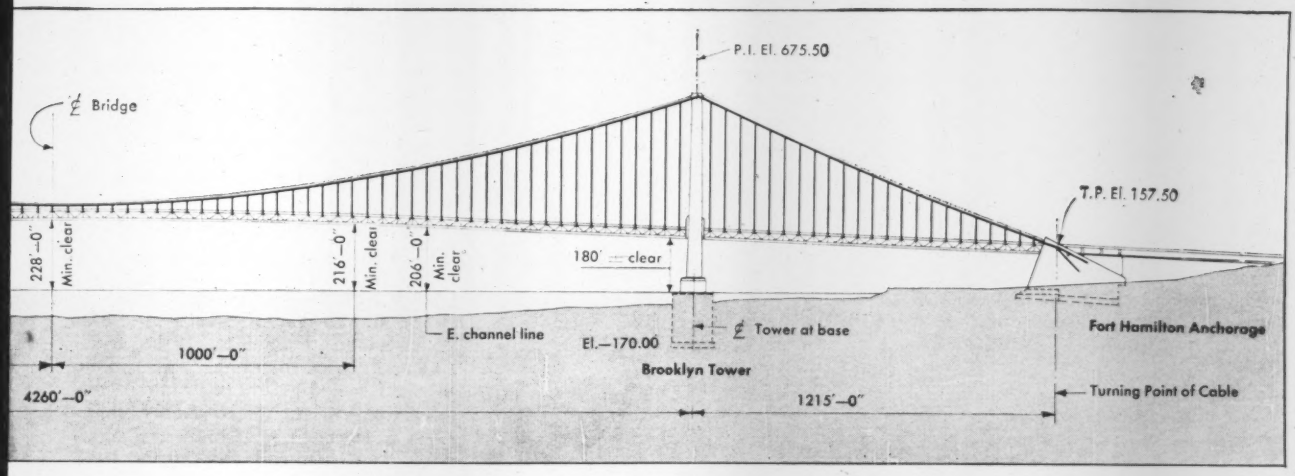
Channel clearance of midspan will be 228 ft above mhw.

And even though it's in a field where behemoths develop slowly, the Narrows Bridge is also notable for the length of time that elapsed between the time it was first seriously proposed and the time construction was actually begun.

It is possible that with the exception of the proposed English Channel Tunnel (which was actually started by Napoleon in 1812) no major water crossing in the world has been argued over for so long or with so much heat. It was first officially proposed in 1888 and in the near three quarters of a century that have elapsed since, countless persons in both official and unofficial roles on local, state and national levels have fought violently against, or enthusiastically for, erection of the great structure.



Narrows Bridge will look like this when it is completed in 1965.



Bridge Is Big, Bigger, or Biggest

Since the final enabling legislation was passed in 1956, hundreds of engineers and technicians have labored over its design and initial planning. Since the first bids were taken in 1959, more than $200 million in construction contracts have been let. And before the structure is completed it will have generated about $600 million in construction work.

The Narrows Bridge is being constructed as part of a billion dollar arterial highway program now under way in the metropolitan New York area. Included in this program is the $173-million double decking of the George Washington Bridge between Manhattan and New Jersey and the $100 million construction of the Throgs Neck Bridge between the boroughs of Queens and the Bronx.

The purpose of the Narrows Bridge is twofold: it will be an important link in a system of roads designed to get traffic from the southern and western states into the Northeast without passing through the overloaded streets of Manhattan, and it will provide, for the first time, a highway link between Staten Island and the other four boroughs of New York City.

Since 1928, when the Port of New York Authority opened the Outerbridge Crossing and the Goethals Bridge, Staten Islanders have been able to drive automobiles to New Jersey. The Bayonne Bridge, also built by the Port Authority, was opened in 1931 to give the Islanders a third highway link to New Jersey. But they have no road link to the rest of their city.

It's a half hour by ferry from Staten Island to Manhattan, and while the boat ride from the Island to Brooklyn takes less time, it is no less trouble.

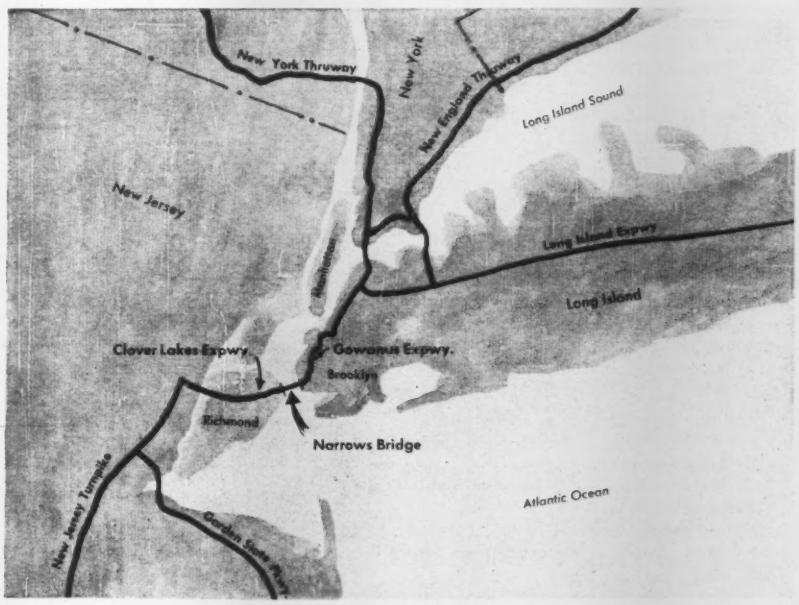
In fact, prior to radar, the island ferries occasionally got lost in heavy fog and drifted for hours with fog horns bellowing, waiting for visual contact with the shore.

Thus Staten Island has been—and still is—geographically isolated from the other four boroughs of New York City. As a result, the Borough of Richmond, which comprises the island, has remained sparsely populated and largely rural. About 60% of the island's land is vacant. Of the used land, much is devoted to farming. Bronx County, with 43.4 sq miles is home to almost 1.5 million people; Richmond with 60 sq miles has less than a quarter of a million.

The Narrows Bridge will change all this.

According to the most conservative estimates, the bridge will be responsible for a doubling of Richmond's population within ten years. S. Sloan Colt, Chairman of the Port of New York Authority, and Robert Moses, Chairman of the Triborough Bridge and Tunnel Authority, both foresee a tripling of the population within 15 to 20 years.

Land values on the Island have already increased greatly and will undoubtedly continue to rise, particularly when the miles of beaches on the south shore of the island become readily avail-



Strategic location of the Narrows Bridge assures it heavy traffic.

Staten Island anchorage required a half-million-cu-yd excavation.

able to people from Brooklyn and Manhattan.

But the beneficial effects of the bridge will extend far beyond Richmond's shore lines. Undoubtedly the greatest benefits will be derived by motorists—and not only those who use the structure. Traffic studies indicate that more than 12 million vehicles will use the bridge in the first year of its operation. This figure is expected to climb to almost 50 million by 1981. The diversion of this traffic from the overload bridges and tunnels across the Hudson and East Rivers will speed travel by those who must use these structures.

The need for a highway link of some kind between Staten Island and the rest of New York has not been questioned in recent years, but construction of the Narrows Bridge was long delayed by two principal factors—location and financing.

A bridge anywhere between Staten Island and Brooklyn must cross the entrance to New York Harbor—and the demolition of such a structure in time of war could conceivably block the Port of New York. For this reason, the Federal Government for years refused permission for construction of a bridge, suggesting, instead, a tunnel.

However, feasibility studies greatly favored the overwater construction as more economical and of greater utility. And the planners had more on their side than mere studies.

A twin tube rail tunnel beneath the Narrows actually had been started in 1923 on a route that was almost directly beneath the line of the present bridge (ENR Apr. 26, 1923, p. 763). The original estimates set the cost of the tubes at about $30 million. By the time the shafts were completed, both in Brooklyn and Staten Island, it was obvious that the cost would exceed $60 million. Engineering and money problems delayed any further work on the tunnel until 1925 when the New York State Legislature, in an attempt to save money and expedite construction, ordered the city to abandon plans for one of the two tubes. Even this didn't work, and eventually the project was abandoned completely.

Later advocates of a Narrows crossing had no desire to get involved in another tunnel fiasco, so the plans were stalemated until 1949 when a joint Army, Navy, Air Force Board finally granted a Federal permit for construction of a bridge.

But the battle for the bridge was just beginning. It was not until 1955 that the New York State Legislature granted formal permission for construction. In the interim years proponents and opponents of the structure had carried their fight to the public in open meetings, in the State Legislature and in the press. Many objections were raised, and numerous alternates were proposed. As late as 1958—after the planning and financing of the bridge were well under control—three New York legislators asked that the work be stopped pending a study of a proposed bridge between Brooklyn and Jersey City, N. J.

All major toll structures between New York City's other boroughs are owned and operated by the Triborough Bridge and Tunnel Authority, and it was generally assumed that the Narrows Bridge also would be. However, in 1955 the TBTA couldn't finance the structure alone so it negotiated with the Port of New York Authority to lay out the needed money. The agreement was that the TBTA would build the bridge with Port Authority money, and that the Port Authority would own the bridge but would lease it to the TBTA until such time as the TBTA could purchase the structure. (As it turned out, the financial picture of the Triborough Bridge and Tunnel Authority improved rapidly and in 1959 it was able to assume full control and owner-

Old frame buildings in army forts are being replaced with . . .

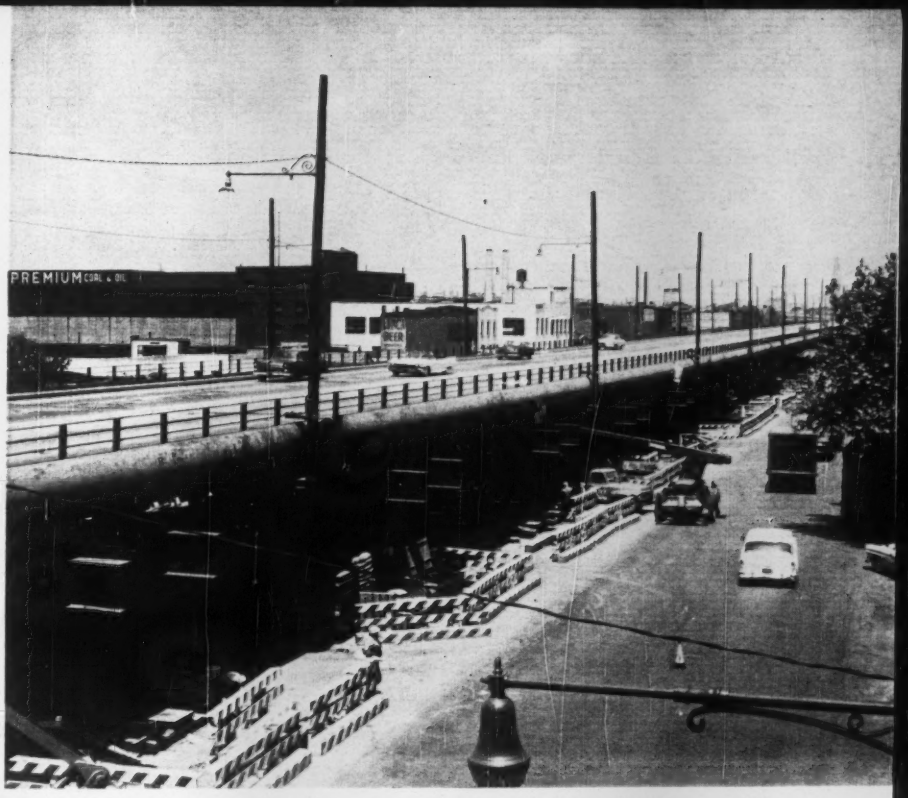
ship after repaving some $30 million spent by the Port Authority.)

Ammann & Whitney of New York was retained to design the suspension structure. For O. H. Ammann, head of the firm, the assignment was another challenge in a long list of imposing accomplishments. Mr. Ammann, as chief engineer for the Port of New York Authority, was responsible for the design and construction of the George Washington Bridge, Outerbridge Crossing, and the Goethals Bridge. He was chief engineer on the Bronx-Whitestone Bridge and assisted in planning the Golden Gate Bridge. His firm designed the Throgs Neck Bridge and numerous other structures.

Then, although federal permission had been granted to span the Narrows, there still remained one complex problem in location. The logical place for the bridge is at the point where the water crossing is shortest. Unfortunately for the bridge planners, this also happened to be the logical place for a pair of forts (which between them could control the entrance to New York harbor) and the forts had been put in long ago.

Fort Wadsworth on Staten Island and Fort Hamilton in Brooklyn have been the site of military installations since the Dutch settled New Amsterdam in the early 1600's, and have been U.S. military reservations since 1827 and 1831 respectively.

Before any real work could be done on the bridge, it was necessary to agree with the Department of the Army as to the relocation of Army installations that were in the way of anchorages and access highways. When the Army finally accepted the proposed changes in 1957, the tab for relocation amounted to about $26 million. Of this, some $16 million was to be spent in Fort Hamilton, $6.5 million in Fort Wadsworth and $4 million at a new installation in the Bullville-Galeville area about 90 miles upstate.



Brooklyn approach is widened and extended for bridge traffic.

Lorimer & Rose, New York architect, was given the job of planning all the replacement buildings at all sites. Madigan-Hyland, New York consultant, was responsible for developing site plans and supervising all construction made necessary by the relocation work.

In 1959 contracts for demolition and construction were awarded to a combine of Slattery Construction Co. and Turner Construction Co., both of New York.

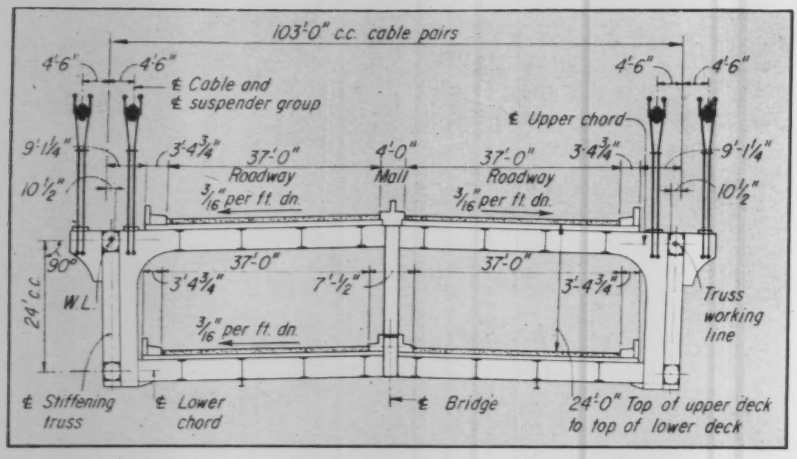
Turner-Slattery has about finished its work at Bullville and Fort Wadsworth and has most of its projects at Fort Hamilton under way. In doing the work, the combine has faced, and will continue to face, a wide variety of jobs. At Bullville, where they relocated a top secret message center previously at Fort Wadsworth, they built an antenna tower and buildings for generators, radio receivers and communications centers. At Fort Hamilton they built a volley ball court, at Fort Wadsworth, a bowling alley.

In between these extremes there are several club buildings, a gymnasium, a library, and barrack buildings, at Hamilton; a dispensary, a theatre, a post exchange, two garages, a rifle range and an incinerator at Wadsworth.

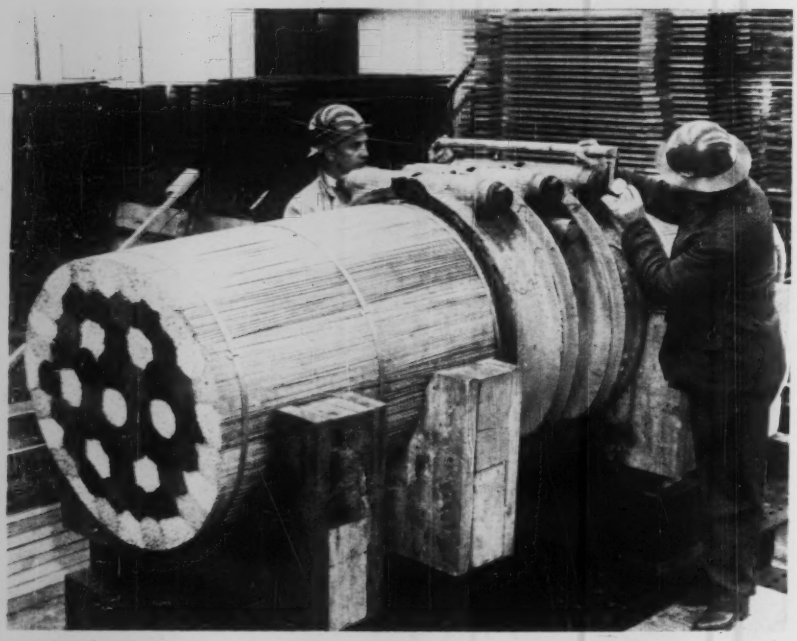
Since the authority had no right of condemnation of federal properties, the Army was able to dictate the terms of the land-for-buildings swap—and according to TBTA representatives the terms were harsh. Most of the structures being replaced were built before World War II. They are mainly of the rough frame construction so typical of temporary Army buildings and, according to authority spokesmen, in very poor condition. Yet none of the replacement structures is for temporary use, most are of brick veneer, all have finely finished interiors (see photographs left).

(*Please turn the page*)

Brick structures at a cost to the TBTA of more than $26 million.



CROSS SECTION shows double-deck arrangement of the Narrows Bridge. Upper level will be built now but will be closed until traffic volume requires it.



CABLE SAMPLE shows how 26,108 wires, each about pencil-thick will be spun to form the four 35 $\frac{7}{8}$ in. dia main cables that will carry the roadway.

Since 1959 the Triborough Bridge and Tunnel Authority has awarded many of the major contracts for bridge construction, and though the job is now just beginning to come out of the ground, a great deal of work has already been done.

The two tower piers are nearing completion. The Staten Island pier is founded at El −105 and is now being topped out. The Brooklyn pier has been sunk to El −147 and has another 23 ft to go. This work is being done under a $16.5-million contract held by a joint venture consisting of J. Rich Steers, Inc. and Frederick Snare Corp., both of N. Y. Steers-Snare is doing its work from sand islands built just off the shore lines of the two boroughs and is using "cookie-cutter" caissons to reach bottom. These caissons measure 229 x 129 ft, contain 66 digging wells and will contain between them 155,000 cu yd of concrete.

Bethlehem Steel Co. is shop fabricating steel for the Staten Island tower under a $23.4-million contract, and Harris Structural Steel of New York is doing the same thing for the Brooklyn tower under a $22.4-million contract. Field erection of the south tower will begin in September and work on the Brooklyn tower will begin early next year.

A combine consisting of Arthur A. Johnson Corp., N. Y., and Peter Kiewit Sons Co., Omaha, is working on the two anchorages under a $17.9-million contract. Excavation of the south anchorage is now at sub-grade and ready for concrete. First stage excavation of the Brooklyn anchorage has been completed.

Sun Shipbuilding and Drydock Co., Philadelphia, has already delivered some eye-bars as part of a $5.6-million contract for anchorage steel.

American Bridge Division of U. S. Steel Corp. has a $56.9-million contract for supplying and erecting the structure's cables and suspenders and now has in storage much of the 750 million lineal ft of wire that will be needed to support the roadways.

Meanwhile, work on the expressway approaches to the Narrows Bridge is also being pushed. The approachways, while not within the province of the Triborough Bridge and Tunnel Authority, must necessarily be considered as part of the over-all crossing project because without them, the bridge would be of little use.

In Staten Island, the 6.6-mile-long Clove Lakes Expressway is cutting a 350 ft swath across the land to connect the Narrows Bridge with the Goethals Bridge, which in turn hooks on to the New Jersey Turnpike and the Garden State Parkway. The main section of the highway is expected to cost about $37 million. A spur running northward to the Bayonne Bridge will cost an additional $3 million.

In Brooklyn, the approachway job is far more complex and much more expensive. The job involves widening, extending in some places, raising in other places razing, the 5.5-mile long elevated Gowanus Parkway. It also requires building a connecting road to the Belt Parkway which runs around the south side of Long Island.

The difficulties attendant to construction in congested areas, and of maintaining traffic on, around and under the parkway during reconstruction, have pushed the cost of this work to more than $84 million.

The approach highways on both sides of the bridge are being built by the New York State Department of Public Works under the Interstate Highway Act of 1956 and are therefore being financed on a 90-10 basis, with the federal government paying the major portion of the costs and the New York State Department of Public Works paying the remaining 10%.

The work on the Narrows Bridge is being done under the director of George Spargo, general manager of the Triborough Bridge and Tunnel Authority; Arthur S. Hodgkiss, assistant general manager and chief engineer; and Joseph Vermaelen, director of construction and maintenance.

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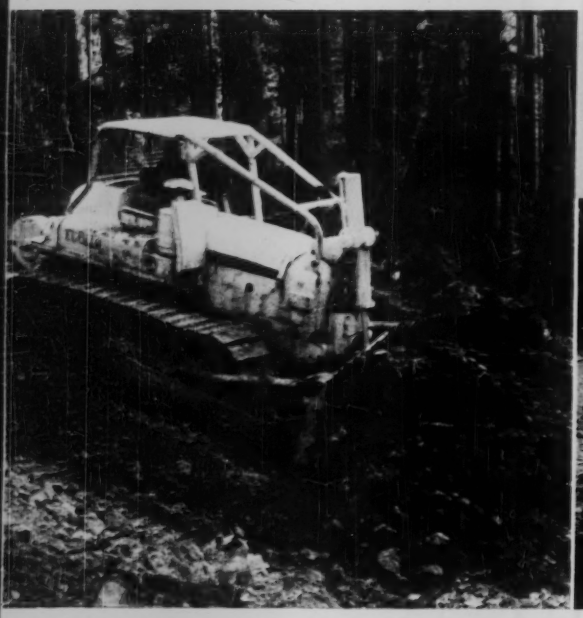

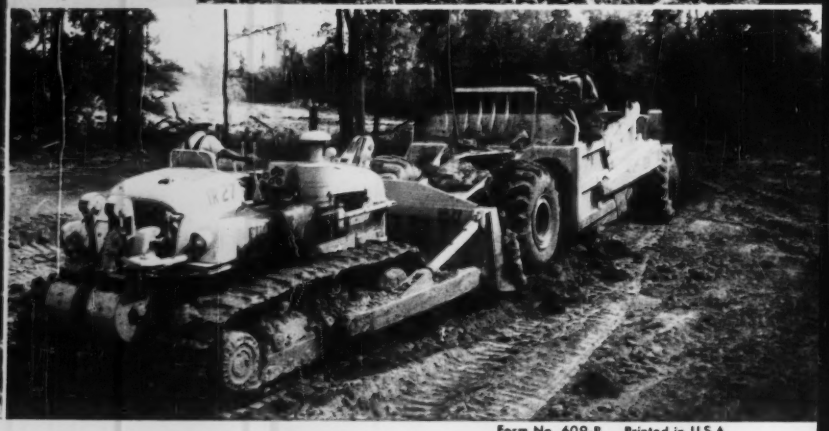

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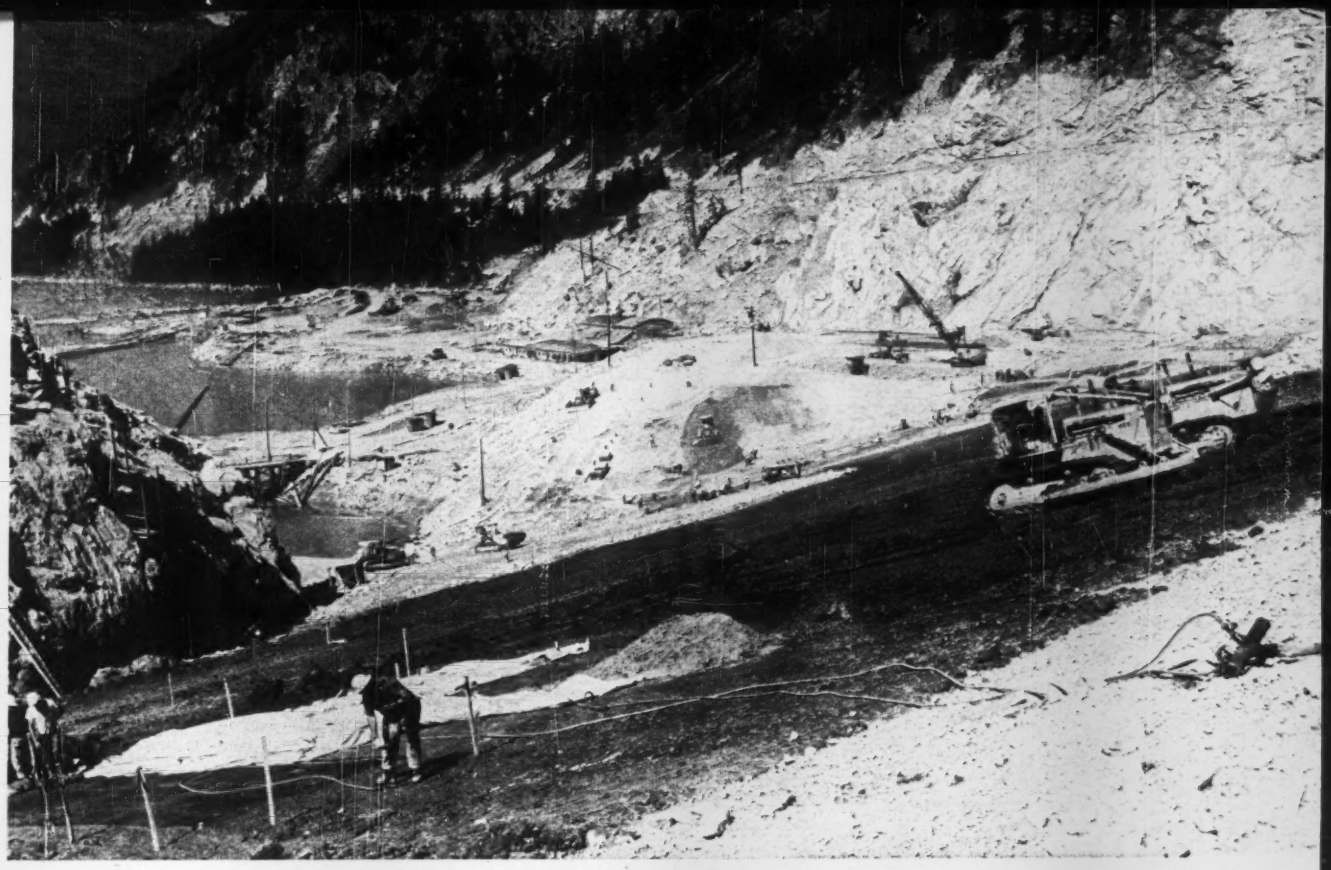
DIVISION OF GENERAL MOTORS, HUDSON, OHIO

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland



Plastic sheet protecting clay core on upstream face is one of . . .

Three Phases of Mission Dam

Now that it's complete, Canada's Mission Dam on the Bridge River looks like a garden variety earth and rockfill dam. But some hybrid construction techniques went into building it.

• Deep-sea divers worked by feel in slurry-filled holes up to 95 ft deep to remove parts of an old sheetpile cutoff wall in a small diversion dam that was incorporated into the new dam.

• A grout curtain for the 200-ft-high dam was injected 500 ft through alluvium to bedrock using grouting techniques new to North America.

• Two acres of polyvinyl chloride were used to sheath the impervious clay blanket on the upstream face of the dam so that the clay could settle and consolidate in the dry.

• **Divers**—An old 40-ft diversion dam at the site complicated initial construction at Mission Dam. By extending the cut-off arrangement of this old dam, engineers were able to incorporate it as the upstream toe of the new, larger dam.

This involved strengthening the old dam's clay core by adding a third row of sheetpiles between an existing double row. The new ones had to go deeper than the old ones to penetrate an underlying layer of clay, but before they could be installed, transverse diaphragms or crosswalls that formed caissons in the old core had to be breached through.

Fourteen such crosswalls were breached, either by pulling or burning off at least two sections. Working entirely underwater or, more specifically, in liquid mud, deep-sea divers did the hazardous job.

They used specially adapted equipment in 5-ft-dia holes filled with drilling mud to prevent cave-ins. The divers worked entirely by touch with only telephone control from the surface. Work took some 440 crew shifts.

The new sheetpiling was placed, welded and driven in successive pairs of sections with lengths up to 106 ft. On completion of the driving, each side of the wall was backfilled. Natural clay bulkheads or, where the depth or width of the trench was too great, artificial bulkheads of grout-filled plastic tubes separated the increments of backfill. Almost 2,300 cu yd of grout went into backfilling.

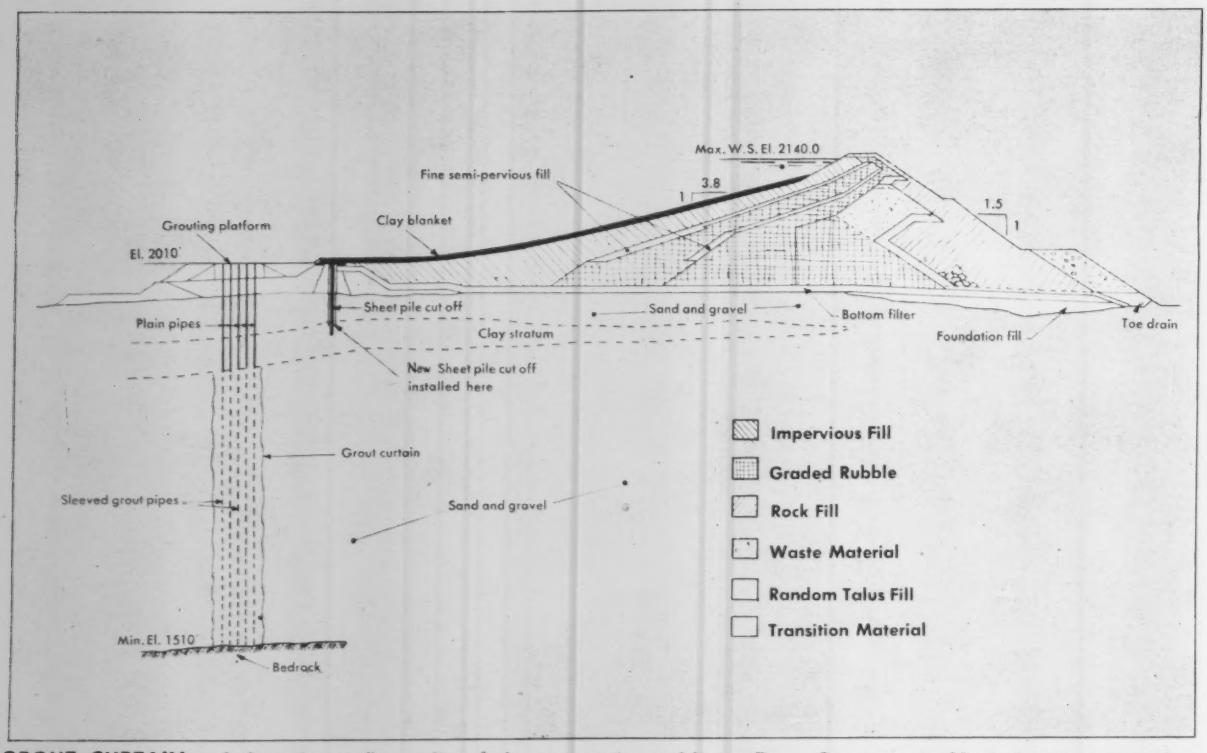
Universal Divers Ltd. handled the diving operation with guidance from Soletanche and Associates. Soletanche is a firm of drilling, grouting and foundation specialists formed jointly by Franch, Italian and Swiss companies. Its activities in Canada are handled by Soletanche and Rodio of Canada, Ltd., Montreal.

• **A new grout**—Soletanche, which has successfully used its grout formula on a number of European dams, used it for the first time in North America at Mission Dam.

The grout is intended to protect the earthfill from seepage through a sand and gravel aquifer that ran between bedrock and a natural clay stratum under the dam. Although the low head diversion dam had no need for such cut-off protection, Mission Dam has to have it in order to perform economically.

Soletanche designed a vertical cut-off consisting of an injected curtain of clay-cement grout and stabilized clay grout placed with sleeved grouting pipes.

Five lines of grout holes, 5⅝ in. dia and spaced 10 ft apart, extended across the river bed. The holes on the outer lines of the curtain were spaced at 10-ft intervals and formed a type of cofferdam within which three lines of holes



GROUT CURTAIN and sheetpile cutoff complicated the construction at Mission Dam. Grout new to North America was used on curtain; divers worked in slurry to make way for new sheetpile cutoff.

were drilled at 15-ft centers. The grout was injected under high pressure from the bottom up using a double packer assembly, first in the outside lines, then in lines two and four, and finally in the line through the center.

Initially a clay-cement grout with a high cement-water ratio was used. This was followed by a more penetrating material for the center line—a phosphate-deflocculated clay stabilized with silicate.

The theoretical width of the curtain is 50 ft. It reaches to a maximum depth of 500 ft.

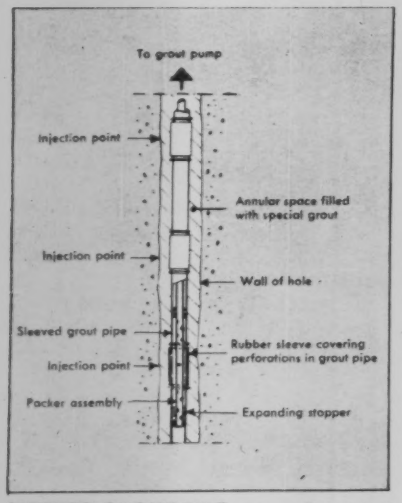
• **Plastic Blanket**—More than 3 million cu yd of fill went into the dam. It stands some 200 ft above the river bed. Its length at the crest is 1,200 ft across the Bridge River Valley.

Rock dumped on the zoned fill was sluiced with water to assure immediate settlement.

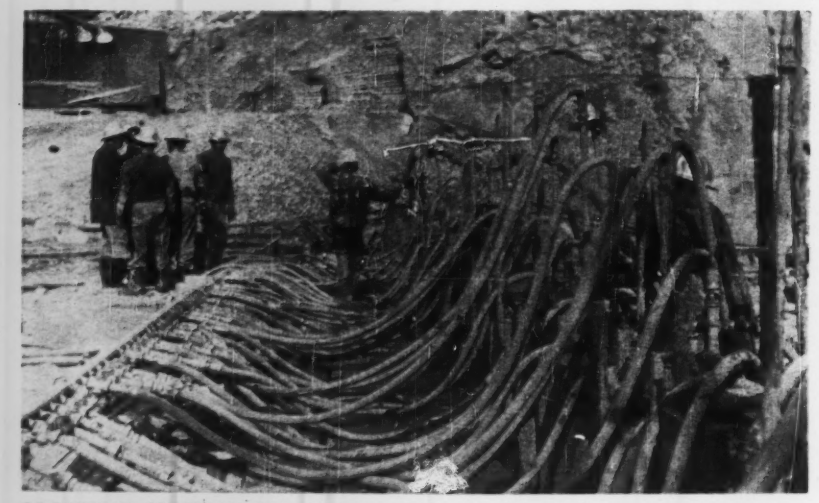
The two-acre impervious clay blanket on the upstream face, however, will settle greatly in the next few years. As it settles, the clay will crack and then gradually reconsolidate into an impervious layer.

To prevent water from penetrating the cracked clay surface and eating away at the fill, a sheet of polyvinyl chloride (pvc) was applied to the clay cover.

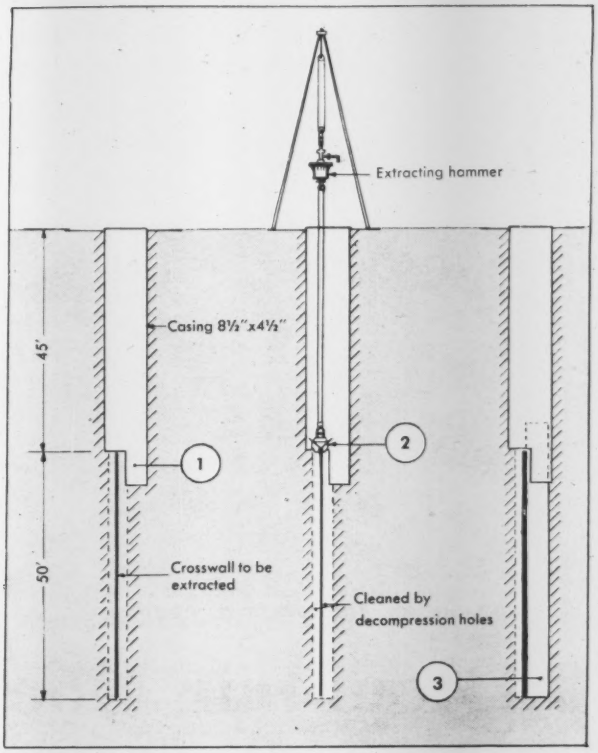
Strips of the plastic 30 mils thick were electronically lap-sealed in the field to form a blanket covering more than 100,000 sq ft. Tests showed the



SLEEVED GROUT PIPE was used to inject grout as deep as 500 ft.



GROUTING HOSES backfill sheetpile cutoff with Soletanche special formula grout. Each hose connects to a 1½ in. pipe.



DIVER ABOVE DESCENDS 45 ft into mud-filled hole sketched at right (1) for job of breaching crosswall in existing cutoff to guide jaw of extracting hammer (2). If pile won't pull, he goes another 50 ft deeper to burn its base (3).

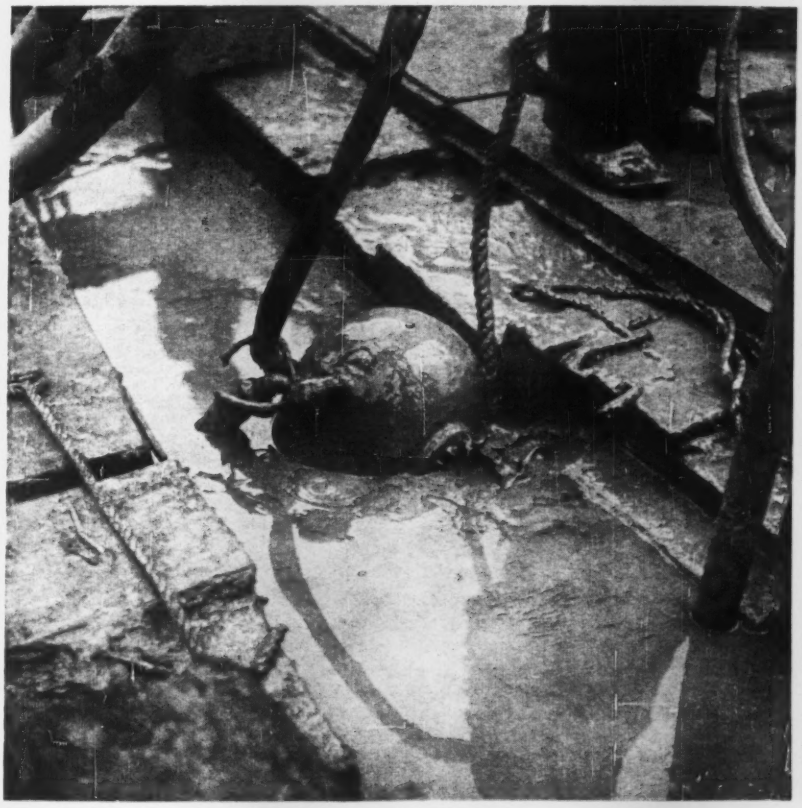
joints to be as strong as the sheeting itself. A 6-ft-thick layer of clay, sand and rock covers the sheet of polyvinyl chloride.

The pvc is calendered from a specially formulated compound. Besides conforming to the uneven 5-ft-thick clay base, it also proved flexible enough to give with subsequent cracking. A rough surface was embossed on the plastic to keep it from slipping on the clay base.

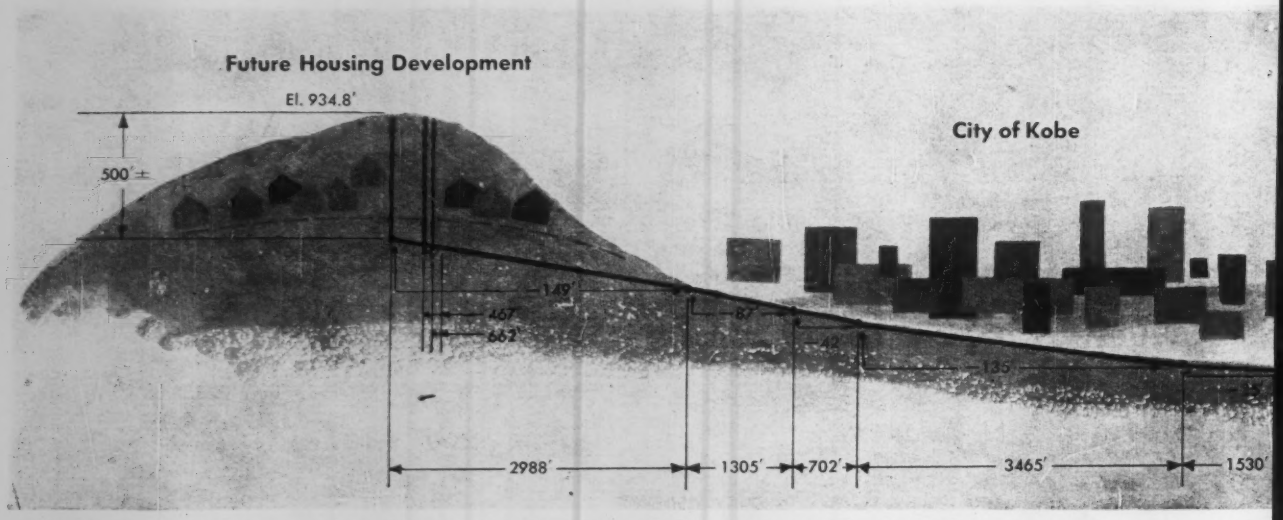
Water backed up by Mission Dam is diverted through a 2¼-mile tunnel that plunges over 1,000 ft to a powerhouse on the shore of Seton Lake. The dam impounds a 750,000-acre-ft reservoir.

British Columbia Electric Co. owns Mission Dam. With its completion the company will have a total of 512,000 kw of generating capacity available to meet increasing demands in Southwest British Columbia and Southern Vancouver Island.

General contractors on the project were Northern Construction and J. W. Stewart Ltd. Consultants were International Power and Engineering Consultants, Ltd. (formerly B. C. Engineering Co., Ltd., Vancouver, B. C.). Karl Terzaghi, Harvard University soils expert, was the consultant. Mr. Emile Huni was manager of Soletanche at the time, and Mr. H. Fabregue was project manager of the Soletanche phase of Mission Dam.



MUD DIVER inspects original sheetpile cutoff to find exact location of crosswalls to be breached. Working blind in thick slurry, divers did everything by feel.



At Kobe, Japan, the top of a mountain is fed into shafts to an underground conveyor for transport

A Mountain Goes to the Sea—From

In the long history of the world, the forces of nature have moved many mountains into the sea and have raised many sea bottoms above the waters. In Japan, right now, a mountain is being moved into the sea, but the forces of man are doing the job—and they're doing it the hard way—underground, and from the inside out.

More than that, they are forcing the mountain to swallow itself so that almost 100 million cu yd of rock and earth can be carried on subterranean conveyor belts for almost 2½ miles beneath a large city to the edge of the sea.

And nothing is wasted: On the land made in the sea will rise great industrial complexes; on the plateau formed by the leveled mountain will rise a housing development; and the tunnel through which the earth is now carried to the sea will become a sewer to serve the housing development.

The underground mountain moving job is being done at the port city of Kobe on the southern coast of Japan's Honshu Island. It's part of a ten year reclamation project for Kobe and its neighboring city, Osaka. When the job is finished in 1970, the land area of the two cities will have been increased by more than 5,400 acres—or 8½ square miles.

Of the two cities, Osaka is reclaiming by far the lion's share of the land—more than six square miles. But Osaka's job is easier—and is being done in a more conventional manner. The average depth of the Bay of Sakii, an ancient seaport south of Osaka, is less than 10 ft. This makes hydraulic fill readily accessible.

At Kobe, the problem of getting fill is appreciably more difficult. The harbor is too deep for the use of conventional dredges—at points very close to shore, its depth exceeds 45 ft. This rules out hydraulic fill. At the same time, the closest available land fill is directly across the city. Any attempts to transport this fill by means of wheeled vehicles would require tremendous amounts of mechanical equipment, create traffic problems and dirty city streets.

To move the dirt, Kumagai-Gumi Co., one of Japan's leading contractors, developed a 12,270-ft-long cable-supported belt conveyor system that comprises nine separate conveyor belts. These belts range from 448 ft to 3,465 ft in length. From the top of a 935-ft-high mountain, Kumagai installed three 10-ft-dia vertical shafts each about 500 ft deep and lined with concrete cribs. From a point about 300 ft up the side of the mountain they tunneled upward to meet the base of the central shaft.

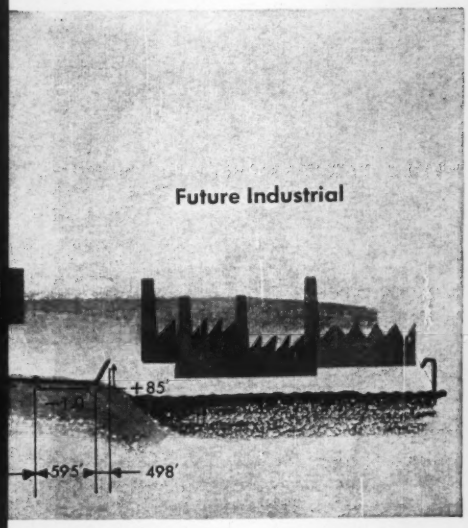
Two side tunnels were extended from the main tunnel to meet the bases of the other two shafts. Within these tunnels the initial stages of the conveyor system were erected. The remainder of the conveyor system is below ground level in a concrete-lined tunnel constructed by a cut-and-cover method.

From the top of the mountain, earthmovers push dirt and eroded marble into the shafts. As ground level is lowered, cribs are removed. At the base of the shafts the primary conveyor picks up the material and starts it on its way to the harbor's edge. The two side conveyors pick up soil from the base of their respective shafts and, at points 448 and 662 ft away, spill their material onto the primary belt. The belts move at a speed of 495 ft per minute and carry more than 1,300 cu yd of material per hour. Between the mountain and the harbor shore, the belts drop a total of 438 ft.

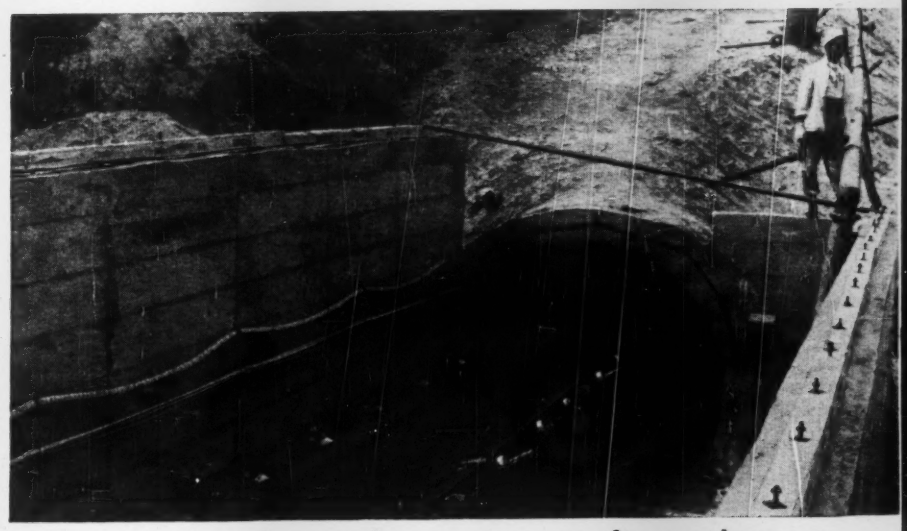
The final conveyor picks up the material from below ground level and carries it more than 85 ft in the air to permit truck loading and stockpiling. The electric motors powering the system total 795 kw and are controlled either independently or as a unit from either of two control stations set up at each end of the system. Emergency switches have been located at 165-ft intervals along the line, and the opening of any one switch will stop the entire system.

Compared to the Kobe operation, the more extensive work at Osaka is duck soup. There, each of an even dozen 1,500-hp diesel electric dredges is pumping sand and silt into the Osaka reclamation area at the rate of about 770 cu yd per hour. Landfill also comes in on several hundred seven-ton dump cars. They make a total of more than 3,000 trips per day.

Originally the Osaka Prefectural Government planned to reclaim less than four square miles, but the increase was forced by the tremendous demand for space by 21 of the country's largest



to the shore. Result . . .



Workman checks underground conveyor at one of exposed areas.

Inside Out

industrial groups, including Mitsui, Sumito, Marusen Oil and Kansai Electric.

The land to be reclaimed at Osaka will be 13 ft above sea level, and surrounded by a 21-ft high dike. The dike will be designed to withstand 140-mph typhoon winds, such as struck Japan in 1950.

In a land that must sustain one of the greatest population densities in the world, every inch of space counts. Japan has a population density of 641.7 people per square mile. India, also overpopulated, has only 329.7 people per square mile, while in the U. S. the figure is a scant 50.4 persons per square mile. (In Japan's 142,644 square miles live an estimated 94,700,000 people; in Montana's 145,878 square miles live only 674,767 people.)

Although work is progressing quickly, the Osaka city government still has two problems to solve: It needs more money now to complete the project; and as soon as the project is completed, it will need more water to make it usable.

The West German Deutsche Bank has promised a $173-million, 20-year loan at an undecided interest rate of between 5.3% and 6.5%. The city also expects to float a $100-million bond issue.

Much of the financing is needed for water. When plants go into operation on the new land in 1970, the city will need more than 140 million gpd. This water will have to be brought in from Lake Biwa, some 35 miles northeast of Osaka.

Shore end of conveyor rises 85 ft for stockpiling and loading.

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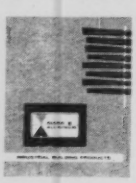

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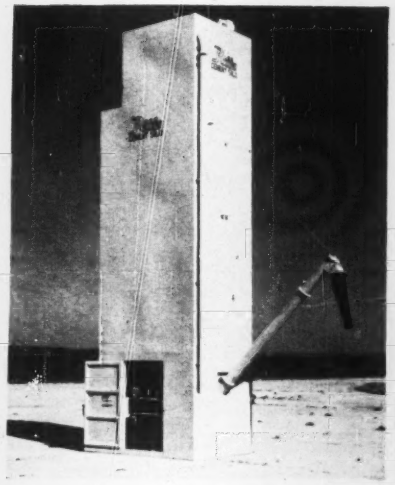

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There are no elevators in this portable cement batcher. A pneumatic receiving system lifts cement from bulk trucks, and gravity feeds the batching cycle. A 9-in. dia discharge screw, 20 ft long, dumps cement from the weigh batch bin into ready-mix trucks.

Gates are air controlled. And each unit comes with a 52-cu ft weigh batch bin, a 5,000-lb capacity scale system, and air-compressor and aeration system.

The manufacturer supplies semi-automatic or fully automatic controls.

The silo can be legally towed without special highway permits, according to the manufacturer, by using a small fifth wheel truck. Ross Porta-Plant Inc., P.O. Box 446, Brownwood, Texas.

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Three models of crawler machines in the ¾-to-1½ cu yd class now feature a tractor type undercarriage that is said to resist wear. The machines are the 85 B-C, at ¾ cu yd; the 100 B-C, at ¾-1½ cu yd, and the 125 B-C, at 1½ cu yd.

Each track on the machines has six rollers and two idlers. For shock absorption the idlers are positioned by double springs. Pads are of the bolt-on type and are available in various widths either as flat pads or with two sizes of grouser. Lubrication of the entire undercarriage is accomplished from a single position.

The machines have an independent swing and travel and are available with several models of gasoline or diesel engines. Quick-Way Truck Shovel Co., P. O. Box 1800, Denver 1, Colo.

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On highway jobs you can move your batching operation quickly, easily, and inexpensively as work progresses. Fewer trucks on shorter hauls (and shorter haul roads) also cut paving costs.

This mobile one-stop paving plant is available with manual or fully automatic batchers. Production rate is 120 to 227 yards per hour. Features two or three-belt aggregate conveyor system and integral, sealed, screw conveyor cement handling system. Two or three-compartment aggregate storage bin can be charged with front end loader. Plant operates on 220 V or 440 V from a single, quick-connect cable.

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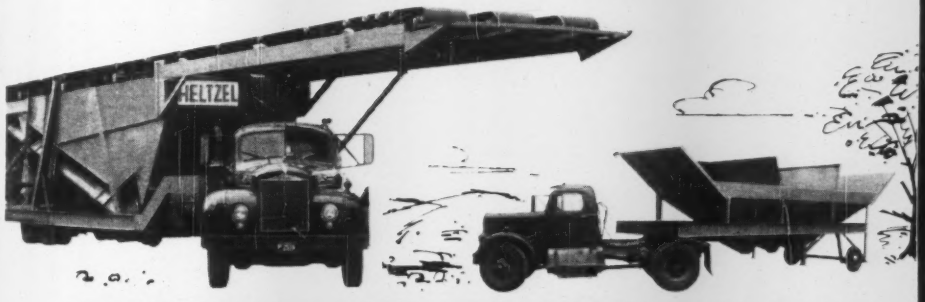

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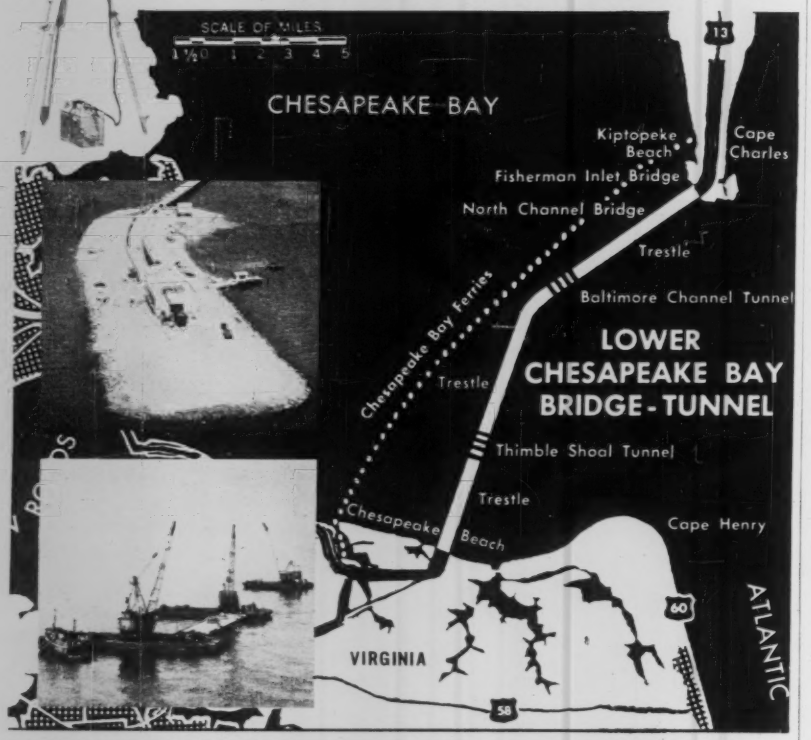
PLAYS AN IMPORTANT ROLE IN THE CHESAPEAKE BAY BRIDGE-TUNNEL PROJECT



From an engineer's point of view, the Bay Bridge-Tunnel will be considered one of man's greatest achievements. 17.5 miles long, this amazing project employed the Geodimeter Model 4 for all distance measurements necessary to establish a highly accurate control net.

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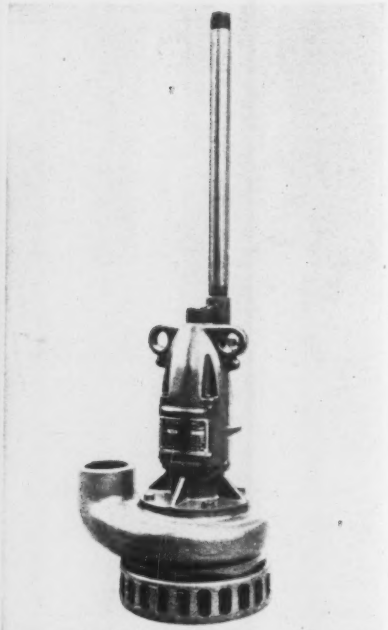


Air-Driven Sump Pump Is Corrosion-Free Bronze

A portable pneumatic sump pump resists corrosion from sewage, sludge, chemicals and water. The pump body, impeller and strainer are bronze.

Thrust and radial bearings support the two-part, non-clogging impeller on a stainless steel shaft. A double seal protects the bearings and air motor from damage by dirt or corrosive liquids.

The pump needs no priming, can pick up liquids over 1⅜ in. deep. It is 19⅜ in. high and can be passed through a hole as small as 10 x 12 in.

Pump speeds vary between 3,200 and 3,600 rpm, depending upon the head against which it is pumping and the supplied air pressure. A built-in governor prevents excessive speed. SCHRAMM, INC., 900 EAST VIRGINIA AVENUE, WEST CHESTER, PA.

Small Rubber-Mounted Rig Carries Long Boom, Jib

The P&H Model 155B-TC is a 15 ton capacity truck crane that can be worked as a back hoe, drag line, clam shell or power shovel. As a crane the machine can lift 15 tons with a total boom and jib length of 105 ft.

As a back hoe with a digging depth of 16 ft 9 in. and as a shovel with a 23 ft 8 in. digging radius, the machine will handle a ½ cu yd bucket.

As a clam shell or drag line with a 35 ft boom, the rig will lift 6,000 lbs. HARNISCHFEGER CORP., 4445 W. NATIONAL AVE., MILWAUKEE 46, WIS.

West Virginia Highway Prices

Information on average unit bid prices—1960, courtesy of the State Road Commission

Items	Unit	Average Unit Bid Prices Min	Aver	Max
Clear & grub, 1	ac	75.00	234.65	700.00
2	lf		0.50	
Excavation, uncl, grade	cy	0.10	0.69	2.00
paving	cy	0.01	0.71	1.75
bri	cy	1.00	1.25	1.65
str	cy	1.75	4.00	30.00
rock	cy	5.00	14.31	30.00
wet	cy	5.00	14.03	65.00
borrow	cy	0.01	0.61	1.60
rock	cy		0.10	
select	cy	1.50	2.30	3.00
Borrow, gran mat	cy	0.50	1.25	2.00
Shoulders & ditches	sy	0.05	0.11	0.25
Subgrade preparation	sy	0.04	0.048	0.065
Drilling, sub-fdn	lf		12.00	
Scarify & manipulate	sy	0.05	0.16	0.25
Sand, for cushion	t	4.50	6.87	10.00
Base course mat, crusher run				
stone	t	2.20	3.92	000
slag	t	3.65	4.37	86.5
gravel	t	2.35	3.87	5.50
steam bed or pit gravel	cy	1.00	2.41	3.50
shale	cy	1.00	1.67	2.50
chert	cy	2.00	2.00	2.00
red dog[a]	cy	2.50	2.75	3.00
Calcium chloride	t		45.00	
Sub-base, course aggregate, crushed, stone	cy		4.00	
selected[a]	cy	2.75	2.90	3.00
Aggregate, base course, plant mix stab	sy		0.72	
prime coat	t	3.30	6.69	10.00
Bit mat, tar	gal	0.20	0.275	0.40
asph, R.C., 1	gal	0.17	0.31	0.50
2	gal	0.17	0.19	0.21
3	gal		0.165	
emul, 1	gal		0.23	
2	gal	0.15	0.17	0.21
Clean & sweep	sy	0.001	0.008	0.03
Aggregate, surf treat, limestone[b]	t	4.40	5.13	6.50
patch & level	t	4.40	4.45	4.50
road mix, gvl[b]	t		3.80	
penetration macadam	t	5.00	5.60	6.24
Asphaltic conc, hot-laid, bottom course	t	6.50	10.18	15.00
FOB plant	t	6.00	6.97	8.50
wearing course	t	6.50	11.46	25.00
FOB plant	t	4.65	6.93	8.60
patch & level course	t	8.50	10.26	11.30
FOB plant	t	4.65	7.00	8.75
base course	t	8.50	10.14	11.30
FOB plant	t	6.70	7.21	7.50
haul & unload	t	0.25	1.04	3.00
place & compact	t	0.50	1.22	2.00
PCC, paving, 9"	sy		8.25	
incl steel, 9" approach slab	sy	5.45	5.80	6.25
w out steel, 10"	sy	6.00	9.47	12.00
12"	sy		12.00	
incl steel, 10"	sy	6.50	11.22	13.50
12"	sy	10.00	13.37	15.50
pvmt, high early strength, patching	sy	9.00	9.50	10.00
Tej, mat	lf	0.28	0.89	2.50
Pvmt reinf	lb	0.12	0.20	0.30
Dowel boxes	lb	0.30	0.35	0.40
Tie bars	lb	0.30	0.70	1.00
CIP, culv, standard, 4"	lf		10.00	
6"	lf		13.00	
8"	lf		6.00	
heavy, 12"	lf		10.00	
CMP, asph ctd[c], 8"	lf		5.00	
12"	lf		5.00	
paved invert[c], 8"	lf		3.00	
15"	lf	4.10	4.30	4.50
18", 16ga	lf	4.00	5.21	8.00
12ga	lf	5.60	6.65	7.00
14ga	lf	4.50	5.17	5.50
24", 12ga	lf		9.00	
14ga	lf	5.66	6.65	7.00
16ga	lf		7.00	
30", 12ga	lf		10.00	
CMP, paved invert[c], 30", 14ga	lf	8.50	9.25	10.
36", 8ga	lf		15.20	
10ga	lf		15.00	00
12ga	lf	10.59	12.62	16.00
42", 10ga & 12ga	lf	15.00	16.33	18.00
48", 8ga	lf		22.00	
10ga & 12ga	lf	17.00	17.75	18.50
54", 8ga	lf	25.00	27.50	30.00
12ga	lf	19.50	22.00	24.00
60", 8ga & 10ga	lf		32.00	
arch, paved invert, w/ integral base[c], 13"x22"	lf		5.00	
11"x18"	lf	3.76	4.13	4.50
Pipe, sect plate[c], 66"	lf		45.00	
78"	lf		50.00	
96"	lf		74.00	
arch, sect plate, w/ integral base, [c] 5'5"x7'8"	lf		70.00	
6'1"x8'10"	lf		80.00	
7'3"x11'5", 7ga	lf		100.00	
Inverts, pave, of exist sect pipe & arches w integral base	sy		10.00	
RCP, culv, 15"	lf		3.85	
18"	lf	3.80	5.19	7.00
18"x18" tee	ea		100.00	
24"	lf	5.55	7.54	10.00
30"	lf	8.20	10.06	12.00
36"	lf	12.00	13.16	14.50
42"	lf	15.00	18.19	21.50
48"	lf	18.00	22.96	26.50
54"	lf	28.00	30.33	33.00
60"	lf	32.00	35.67	38.00
72"	lf		42.00	
ellip, 14"x23"	lf	7.00	7.75	8.50
xtr strength, 18"	lf		5.60	
24"	lf	7.00	8.40	12.00
30"	lf	11.00	12.50	14.00
36"	lf	14.85	15.95	18.00
42"	lf		20.95	
48"	lf		32.00	
VCP, xtr strength, 12"	lf		3.80	
15"	lf		9.00	
4"	lf		3.33	
Pipe, relaid	lf	2.00	2.00	2.00
Piles, treat timber	lf		2.25	
steel bearing, 10"	lf	5.40	6.82	11.70
12"	lf	6.00	6.50	7.50
14"	lf	6.00	6.75	7.50
drive	lf	3.00	3.78	5.00
splice	ea	18.00	22.00	30.00
Tension hooks, top of piles	ea		2.50	
Repainting, old masonry	sy		3.00	
Riprap	cy	10.00	17.57	25.00
Protection, fdn	cy		5.00	
slope	sy	6.00	6.78	8.00
Conc, cl A	cy	50.00	62.93	150.00
in superstr	cy	50.00	61.69	75.00
light-wt, air entrained	cy		85.00	
cl A, in substr	cy	43.00	53.15	100.00
cl B	cy	22.00	61.27	90.00
Bri slab, precast	lf		33.00	
Railing, conc	lf	8.00	10.00	12.00
alum, tp A, single	lf	4.62	4.90	5.25
tp B, double	lf	5.75	7.52	12.50
Steel bars, reinf	lb	0.12	0.15	0.50
Wire fabric, welded	lb	0.25	0.32	0.40
Bolts, anchor exp, hooked, ¼"x4"	ea		0.50	
¾"x6"	ea		1.50	
¾"x11"	ea		1.50	
Dampproofing	sy	2.00	2.12	2.50
Waterproofing, membrane, w out protect course	sy	1.50	3.25	5.00
w protect course	sy	5.00	9.75	13.00
Cement, for shoterete	bag		20.00	
Lumber & timber, treated	Mbm	340.00	407.56	600.00
CMP, underdrain, std[c], 6"	lf	1.75	1.75	1.75
8"	lf	2.00	3.95	6.00
helical[c], 8"	lf		1.50	
[c], 6"	lf	1.20	1.42	1.75
8"	lf		1.40	
Pipe, conc, plain[c], 6"	lf		1.40	
8"	lf	1.00	1.25	1.40
10"	lf		2.00	
xtra strength, 6"	lf		1.10	
reinf[c], 6"	lf		3.00	
8"	lf	2.00	2.13	2.50
drain, porous, 6"	lf	1.00	1.33	1.60
8"	lf	1.30	1.53	1.70
VCP, underdrain[c], 6"	lf		1.00	
8"	lf		1.25	
Stone, crushed, gvl or sand for underdrain	cy	4.60	6.59	9.00
gvl for culv fdn	t		4.50	
Drains, horizontal	lf		1.50	
Curb, conc plain, std	lf		4.00	
mount tp	lf		3.00	
integral	lf	0.95	2.34	5.00
mount tp C	lf	0.80	2.40	4.00
Curb & gut, conc, comb	lf	3.25	4.03	5.40
Median, conc	lf		3.50	
Curb, spec bri	lf	2.00	4.08	5.40
plain asph conc, hot-laid	lf	2.00	2.00	2.00
Gutter, conc	sy	6.50	7.79	10.00
stone	sy		4.00	
dumped rock	lf	3.00	4.42	5.50
Cstg, drop inlets	ea	30.00	48.07	80.00
MH frame & cover	ea	60.00	79.22	100.00
w out holes	ea	60.00	67.50	75.00
ring tp	ea	70.00	78.33	90.00
curb inlet	ea	75.00	77.50	80.00
Inlets, drop[b]	ea	150.00	254.23	400.00
drop, precast covers	ea		300.00	
MH[b]	ea	200.00	472.22	1,000
Inlets, curb[b]	ea	150.00	325.00	500.00
hillside drop[c]	ea	200.00	266.76	400.00
median strip curb[c]	ea	420.00	447.50	475.00
drop, compl, tp A	ea	300.00	341.67	400.00
Jct box, underdrain[b]	ea	150.00	175.00	200.00
Inlets, spec tp A[c]	ea	250.00	319.00	400.00
MH, adj	ea	100.00	200.00	300.00
Guardrail, steel beam tp, conc posts	lf		2.75	
steel posts	lf	2.00	2.56	3.25
on bri	lf		3.50	
Cribbing, conc	cf	5.00	5.57	6.50
Fill, rock, spec	cy	0.10	1.69	5.00
Water, for comp & dust palliative	Mgal	1.00	6.35	30.00
Aggregate, maintain traffic	t	1.00	2.92	5.00
Calcium chloride, dust palliative	t	60.00	65.00	75.00
Markers, project	ea	20.00	41.66	100.00
survey	ea	10.00	20.80	30.00
Fence, ROW, chain link	lf	1.00	1.67	2.50
woven wire	lf	0.65	0.74	0.80
temporary	lf	0.10	0.13	0.15
Limestone, grnd agricul	t	12.60	18.36	50.00
Fertilizer	t	80.00	88.92	100.00
Seed & mulch, 1	sy	0.06	0.08	0.12
2	ac	250.00	413.38	500.00
Tree trim, selective 12" & under	ea		20.00	
over 12"	ea		20.00	
Stakes, const layout, grade	mi	3,386	7,083	10,629
paving	mi	1,672	2,145	2,617
Emblems, cast stone	ea		400.00	
Conc admixture	lb	0.15	0.25	0.35

a compacted in place b 160# per sy c transverse expansion joint d fully coated e fully coated & field paved f perforated & fully coated g perforated h compl except cstgs I compl w/grating j compl except grating

ENR Construction Cost Index (1913=100)
20-cities average—1960 = 823.55

To compare 1960's average unit prices based on contracts awarded with '57, '58, and '59, see ENR, June 23, 1960, page 92.

Highway Price Trends In Iowa, 1958-1960

Average contract prices show mixed trend over three year period; bridge and culvert costs down—road costs up.

Item	Unit	1958	1959	1960
Road Work				
Grading[a]	cy	$0.171	$0.205	$0.250
Conc pavement, standard	sy	4.931	5.236	5.250
tp A	sy	2.790	2.886	2.815
Asphaltic conc, cl A[b]	t	7.145	7.239	6.822
cl B[c]	t	5.171	4.899	4.792
Surfacing, gravel	cy	1.662	1.674	1.990
crushed stone	cy	3.201	2.798	2.818
Bridge and Culvert Work				
Conc masonry	cy	47.749	49.137	49.136
Steel, reinf	lb	0.121	0.119	0.118
structural	lb	0.212	0.188	0.180
Piling, untreated	lf	1.711	1.542	1.686
creosoted	lf	2.596	2.517	2.446
Excavation, str, cl 20	cy	2.576	2.471	2.609
cl 21	cy	16.634	18.306	16.583

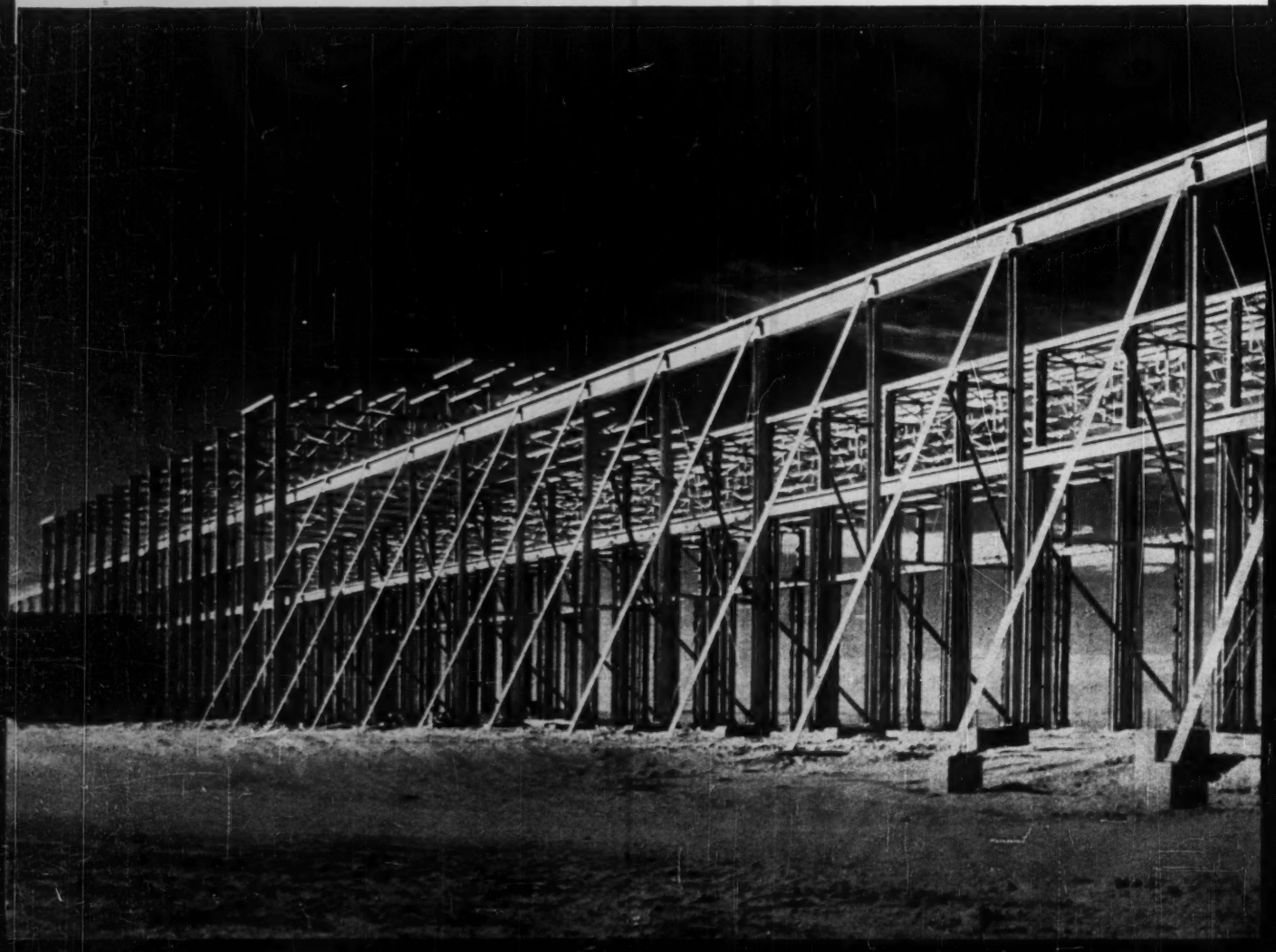
a cl 10 excavation, roadway and borrow b used on interstate and primary roads c used on farm to market road system

ENR Construction Cost Index (1913=100)
20-cities average—1958 = 759.16
1959 = 796.91
1960 = 823.55

Rolling Mill redesigned with A36 Structural Steel Saved: 44 tons

This mark tells you a product is made of modern, dependable Steel.

The new rolling mill building for Border Steel Rolling Mill, Inc., El Paso, Texas, is 800 feet long, 142 feet wide and 50 feet high. Design, steel fabrication and erection by Ramsey Steel Company, Inc., El Paso, Texas. Mr. W. K. Ramsey, President (left) and Mr. G. W. Ramsey, Chief Engineer.



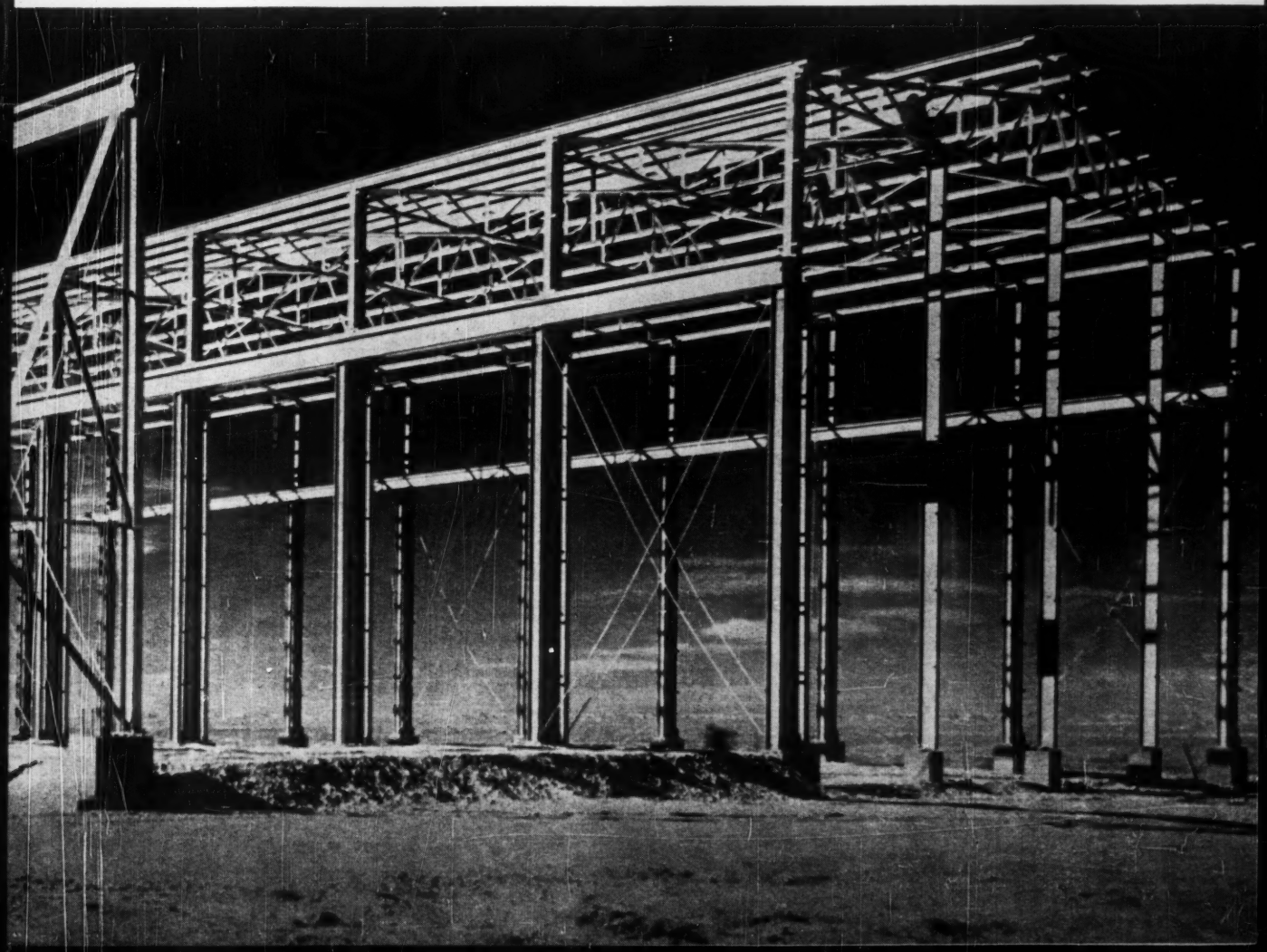
"We redesigned the rolling mill building for Border Steel Rolling Mill, Inc., to take advantage of the higher strength of A36 Steel. Our original plans were made before the introduction of A36 Steel," said Mr. W. K. Ramsey, president of Ramsey Steel Company, Inc., "and called for 794 tons of A7 Steel. By redesigning with A36 we cut the cost of structural steel almost 10%. In columns and beams alone we saved 44 tons of steel. A36 Steel also saved us $6.00 a ton on shipping charges. At that time, A36 wasn't available in all shapes or we could have saved even more by making the roof trusses of A36 Steel, too."

The building design strength was determined by the 15- and 30-ton overhead cranes and their traveling loads. The building will house a rolling mill and a melt shop in a separate bay. Roof and siding will be corrugated galvanized steel sheets. All fastening was done with high strength bolts. Ramsey Steel Co. erected it in only 30 days.

Investigate the advantages of designing with A36 Structural Steel. Its higher strength can save you money. Delivery is no problem. You can get fast delivery of the complete range of USS Structural Steels from your Steel Service Center. For more information write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

United States Steel Corporation • Columbia-Geneva Steel Division • Tennessee Coal and Iron Division • United States Steel Supply Division • United States Steel Export Company

USS TRADEMARK **United States Steel**



Materials Prices

Monthly Market Quotations By ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, June 22; Next, July 20.
- Wage Rates Building Board Insulation: Last, June 1; Next, June 29.
- Iron & Steel Products, Pipe: Last, June 15; Next, July 13.
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, June 8; Next, July 6.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
STRUCTURAL CLAY TILE																							
partition-scored																							
3x12x12 in	M	$154.95pe	$217.00	$135.00pss	$232.00†	$137.00ll	$179.00mmjvv	$205.00ff	$162.00	$170.00	$257.00	$158.00 r	$218.00pe	$178.00	$236.00wwh	$258.00ss	$200.00t	$180.00mmpp	$156.85*	$235.00pt	$168.78Rnqoo	$169.00rr
4x12x12 in	"	154.95pkke	231.00	152.00pss	248.00†mm	149.00ll	190.00mmjvv	219.00f	162.00	185.00	274.00	158.00 r	225.00pe	178.00	315.00wwh	276.00ss	213.00t	199.00pp	177.10*	270.00pt	180.93anqoo	185.50rr
8x12x12 in	"	309.90pe	434.00	.....	463.25†mm	280.00ll	355.00jddmm	410.00	318.75	310.00	514.00	312.00 r	452.00pe	371.25	378.00wwch	517.00ssxx	400.00t	380.00pp	235.30dd	490.00pt	325.00aaqoo	360.00rr
Load Bearing—Scored																							
8x12x12 in	"	387.40pe	491.00	303.00p	556.00†mm	.....	390.00jmmvv	465.00ff	387.00	310.00	582.00	312.00 r	225.00pwe	371.25	384.00wwhn	586.00ss	453.00t	410.00pp	159.40qq	265.00pwt	220.00qoo	281.50rr
10x12x12 in	"	.....	602.00	376.00p	.....	.....	422.00jmmvv	.....	472.50	390.00	767.00	400.00 r	.....	.....	.....	.....	607.00t	440.00pp	.....	.....	400.00qoo	405.00rr
12x12x12 in	"	690.00	465.00p	.....	.....	.....	500.00jmmvv	709.00ff	385.00	442.00	876.00	500.00 r	.....	.....	.....	.....	693.00t	621.50pp	.....	.....	.....	.....
BRICK, common backing	"	33.25uu	36.00	27.00†	43.50p	32.00	50.00jk	43.25tt	32.00	35.00xx	53.50pmm	34.00	$42.00uu	49.50vpe	42.00	46.00p	40.00mm	42.00t	44.00mmpp	43.00*	57.00t	48.25b	25.00rr
Straight hard	"	33.25uu	41.00	38.00	58.00p	34.00	49.00jk	47.25ggtt	53.00	54.00	54.00pnmm	34.00	44.00	58.00vpe	55.00	.....	45.00mm	40.00t	45.50pp	43.00*	71.00t	56.30b	60.00rr
LIME, in paper Hyd. fin.	"	42.50hh	35.80	38.25mm	42.00§	1.00aaa	29.20jmm	32.75ptt	38.36	48.00p	38.00mm	36.26	38.00nn	150.00bbe	48.00p	40.00p	40.00mmp	30.00t	1.00aapp	29.24	52.00bbt	39.00	34.00mm
" " Com hyd	"	35.50hh	23.40	20.87mm	34.00§	0.90alaa	29.20jmm	28.00ptt	23.32	44.00p	30.00mm	34.26	38.00nn	140.00bbe	40.00p	38.00p	24.50	26.00t	0.80aapp	29.24	38.00bbt	22.00	36.40mm
" " pulverized	"	.....	26.33gmm	.....	.....	.....	29.20jmm	.....	26.00	46.00p	40.00mm	29.76	39.00nnll	52.00bbde	.....	.....	27.50	34.00t	1.35zaapp	31.74	1.30mbbt	13.25	34.75mm

•§ F.o.b. yard. •** F.o.b. plant Stockton. •† F.o.b. yard Roxbury. •a Smooth. •b $4.50 del. •c 8 x 12 x 12 in.-6 cell. •d Pulver-ized hot. •e less 5% disc., 10th. •f 8 x 8 x 12. •g Lumps, $26.72. •h F.o.b. trucks, job site N.Y.C. •i 60 lb sacks. •j Truck load or over. •k $1.00 discount per M, 10 days. •m Per bb. 180 lb. processed. •n 7¾ x 7¾ x 12. •o Mason's double hydrated pressure. •p Truck lots. •q Provincial and Municipal tax extra (6%). •r Not used: earthquake danger. •s 8 x 16 x 12. •t less 2% disc., cash. •u In Federal tax. •v Sand lime. •w 5 x 8 x 12. •x dumped. •y Chi common. •z Pebble; 80 lb sack. •aa 50 lb sack. •bb LCL. •dd 6 x 12 x 12. •ff 80% common. •gg Smooth. •hh less 25¢ disc., cash. •ii F.o.b. plant. •jj rough; smooth; $40. •kk 3½ x 11½ x 11½. •ll less 2% disc. 10th. •mm less 2%, 10 days. •nn F.o.b., L. A. •oo less 2%, 30 days. •pp add 2% sales tax. •qq 8 x 5½ x 11½. •rr 2½% disc., 10 days. •ss 5% disc., 10 days. •tt less 2% disc., 15th. •uu less 50¢/M, 10 days. •vv 4000 pcs. and over. •ww Now manufactured in perodic instead of tunnel kiln.

PAINT, ROOFING—F. O. B. CARLOAD LOTS

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
LEAD, red, dry	CWT	$14.75	15.10gg	$17.50pp	$21.00jj	$24.95†oomm	$15.25rqqpp	$15.25†JO	$25.65†	$22.50	$23.85n	$15.95r	$26.90ggool	$16.25yy	$16.25N	$23.00jjpp	$14.75ee	$14.75mmO	$21.50nggJ	$25.65†m	$26.70mm	$13.35HO	$19.45O	$13.95
White, in oil	"	24.00ggJ	24.00	29.00†J	26.90†mmm	24.00†J	24.00†J	26.90†	23.50M	24.00	24.00rr	25.65	22.00	21.50kk	24.00J	29.75	19.00mm	24.00J	26.90	26.90mm	24.00H	26.00wtt	20.85
READY-MIXED PAINT																							
Graphite b	gal	....	3.00	3.90J	.....	.....	.....	3.31ggP	....	3.70	....mm	3.99	3.30	.....	.....	.....	3.35mm	2.20rFJ	.....	3.20mm	.....	5.52DHt	5.15J
Aluminum	"	4.10	4.40	3.40J	.....	.....	.....	3.63zggg	3.25B	5.10	....mm	3.43	4.50n	.....	.....	.....	3.90mm	2.25rFJ	.....	4.30mm	4.19eeHJ	6.55xH	6.18J
Ferric Oxide	"	3.31	3.50	.....	.....	.....	.....	4.25ggg	....	....mm	3.01	4.20n	.....	.....	.....	.....	3.65mm	2.25rGJ	.....	3.50mm	.....	5.10kHt	5.95J
ROOFING SUPPLIES	square	2.90kk	3.06	2.95†mm	3.55q	3.45ukk	2.99mm	2.85q	3.00n	2.94	2.85mm	3.00mm	3.40nkk	2.85kk	$2.78	2.99xx	.....	2.90sH	2.99isrmm	2.87mm	3.70eeH	5.40	3.50
Rolls, slate surf	CWT	2.20kk	3.67	2.17†mm	2.60q	2.75okk	2.19mm	2.10o	3.00o	2.25o	2.10ommll	2.50omm	2.40njkk	2.10hikk	1.98	2.19xxo	2.65	2.15eH	2.19hhK	1.72aaiimm	3.06heeH	4.65t	2.40aae
Asphalt felt	"	2.85kk	4.04	3.17†mm	3.04q	3.15okk	2.64omm	2.55o	3.00o	2.80o	2.55ommll	2.50omm	.....	2.55bikk	2.85	2.64o	1.81	2.15H	2.64hhK	2.59mm	.....	4.65†	2.40o
Asphalt coating	gal.	0.67kk	0.50	0.76†mm	0.55q	48.00bbkk	0.56yimm	0.41y	0.47O	0.50ff	0.56ffmm	0.55y	0.75nykk	0.52ikk	0.68	0.52z	0.74	0.56H	0.58yK	0.46jj	0.59ee	1.60	0.70j
Tar pitch	ton	65.35kk	54.00	48.00eemm	60.00q	57.70†kk	57.96Hmm	49.00gg	66.00hh	50.00	49.00mm	.....	s	50.00rkk	45.50	49.00*	49.00	55.00H	57.60K	54.00	.....	4.40uu	50.00A

•† Delivered. • Note: Red lead in oil 50% higher than white lead in oil. •** Aver. wt. approx. 425 to 550 lb drums. •a Red lead prices change frequently due to pig lead price changes. •b U.S. War Dept. Spec. 3-49A. •c ASTM Spec. D266-31. •d 80% minimum ferric oxide. •e Per 108 sf roll. •f Per 432 sq ft. •g F.o.b. yard Roxbury. •h Per roll, 65 lb. •i Net carload prices, Minneapolis and vicinity. •j 45 gal containers. •k Over 80% ferric oxide. •l Not used. •m 100 lb keg. •n F.o.b. city. •o Per 60 lb roll. •p 6-drum, 50 gal each. •q Per 90-lb roll. •r F.o.b. factory, Chicago. •s Truckload. •t Incl. Federal tax. •u Per 90-lb square. •v Per ton. •x Ready-mixed. •y 55-gal container. •z Drums. •aa 15 lb. •bb Roofers coating and cement. •cc LCL, truck delivery. •ee Asphalt pitch in 100 lb package. •ff 5-ga drums. •gg F.o.b. factory. •hh Incl. freight. •ii Per 324 sf roll. •jj Asbestos roof coating. •kk less 2% disc., 10th. •mm less 2% disc., 10 days. •oo 100 lb bbls. •pp 50 or 100 lb bags. •qq 500 lbs or more. •rr F.o.b. plant, Detroit. •ss 50 lb bbls. •tt 25 lb kegs. •uu 250 lb bbls. •xx Sept.: Rolls revised to $2.75, Asph. Felt revised to 1.71. •yy Sept. revised to $12.00. •zz Sept. revised to $2.80. •A 400 lb barrels. •B ASTM Spec. D962-49. •C 95%. •D Std. black. •E Milt. spec.: •E TTP27; •F TTY81; •G TTP31. •H less 2% disc., cash. •I Per 100 lb. •J less 1% disc., 10 days. •K add 2% sales tax. •L CL. •M 1 ton or more. •N under 500 lbs, add $1. •O 50 lb. bag.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
PLASTER, neat	ton	$33.00ss	$24.00	$37.00ss	$26.00	$1.45bbtt	$24.95*ss	$29.00*ss	$32.80	$29.00	$28.00ss	$30.00	$28.00tt	$36.00F	$34.00	$27.00	$27.00	$30.00nn	$30.00	$29.50ss	$42.40nn	$22.60h	$0.70bb
gauging	"	45.00ss	35.70	43.00ss	30.00	1.45bbtt	24.95*	45.00N	35.60	29.00	28.00ss	35.00	29.00tt	36.00F	48.00	35.00	33.00ss	31.00nn	42.00	30.50ss	45.60nn	35.60h	1.25bb
VERMICULITE																							
Home insul. pellets	4 cf bag	1.65ssss	0.95	1.55ss,	1.40	1.55	1.75*ss	1.14ss	1.05	1.63	1.27ss	1.19E	1.25	1.65tt	1.32P	1.35	1.40ss	1.25nn	1.50	1.38ss	1.55nn	1.25h	1.47bb
plaster agg.	"	1.65ssss	....	1.55ss	1.40	1.60	1.75*ss	1.16ss	1.21	1.40	1.31ss	1.21E	1.20ktt	1.80F	1.23P	1.38	1.25ss	1.30nn	1.60	1.38ss	1.35knn	1.40h	1.43bb
concrete agg. treated	"	1.85ssss	.....	1.60ss	1.40	1.60	1.85*ss	1.24ss	1.37	1.50l	1.40ss	1.29E	1.45	1.95Fl	1.40P	1.50	1.45ss	1.40mm	1.65	1.50ss	1.85lnn	1.60h	1.66bb
PERLITE, plaster agg.	"	1.65ss	1.15	1.27ss	1.55ss	1.60	1.75ss	1.45ss	1.21	1.50ss	1.45kii	1.21	1.16	1.40S	1.15P	1.45	1.05ss	1.40nn	1.50	1.38ss	1.50k	1.15v	1.14Q
concrete agg. untreat.	"	1.65ss	1.55	1.27ss	1.55ss	1.60	1.75ss	1.45ss	1.32	1.60ss	1.50kii	.....	1.26	1.50S	1.15P	1.40	1.05qqss	1.40nn	1.60	1.58oss	.....	1.15v	.....
BUILDING SHEET																							
Alum. flat, .100"	lb	0.469noo	0.462	0.456M	0.474	0.564x	0.469	0.459aa	0.469	0.479	0.475a	0.463	0.459	0.469	0.469	0.489aT	0.479	0.475	0.499	0.575	0.50D	43.95AH	0.4375
corr. roof, .032"	sheet	9.67nY	0.451r	9.66K	25.07AAp	33.43p	9.35	25.07p	0.484r	10.89	10.35a	24.66ggvyp	8.772Z	10.09	33.43	0.2507aXAA	10.98	10.39	9.18	10.83	10.75D	12.10H	26.00ap
Stainless steel, 20 ga	CWT	64.44nxx	63.00	64.56K	64.42*ddxx	62.65re	61.00xx	61.58ooxx	64.09	65.32gg	63.00axx*	67.50E	62.02	63.61GR	63.00Y	64.08a	63.71	63.00	63.39Kmmgg	65.00K	54.02D	65.75H	73.74
28ga	"	72.69nxx	71.25	73.00K	72.67dd	71.25re	71.25xx	71.58ooxx	72.34	73.57gg	71.25axx*	76.25E	73.27	69.61fG	83.50Y	73.33	71.96	74.50pp	71.64ygg	77.25K	73.27D	.....	86.52

•‡ trucklots, delivered. •† fob warehouse. •** ob city. •a delivered. •b ½" O.D. •c ⅝" O.D. •d per sf. •e 34" x 60" sheet. •f per 100 ft. •g 5 tons & up; cold roll, anneal & pickled 2B finish. •h incl. Federal tax. •i add 25¢ for pint of additive. •j 1100 & 3003 alloy, mill finish. •k bag of 3 cu ft. • treated with air entraining agent. •m 2-10M ft. •n fob mill fr equalized with nearest stocking competitor. •o 250 sacks or more. •p 100 sf ft. •r per lb. •s 30 lb bag. •t 36" x 108";-10.81 lb/sh; 48" x 144"; 21.7 lb/sh. •u 19.31 lb/sh. •v fob plant. •w 48 x 144" •x 0.117"th. •y 27 gauge •aa 16M lb & up. •bb Per 50 lb bag. •dd add $1.00 cwt boxing. •ee tons & up. •gg add $2/cwt boxing; $0.75/cwt on skids. •hh Theoretical wt for 48" x 96"; 60.4-lb per sh. •i 300-bag lots. •jj 100-lb bag •mm Theoretical wt: 19.7-lb per sh •nn 2% cash •oo skid packed •pp type 304 •qq Philadelphia and suburbs. •rr less 2% disc. 15 days. •ss less 2% disc. 10 days. •tt less 2% disc. 10th. •uu add 2% sales tax. •vv Type N. •xx less ½% disc. 10 days. •yy .021 ga. •zz .061" th. •A Per 100 lb. •C 15M lb. •D less ½% for cash. •E Quantity differential. •F less 5% disc. 10th. •G less ½% disc. 10th. •H Fed. tax exempt. •K less ½% 10 days. •L 5% disc. 30 days. •M 3003: .452 for 1100. •N less 2%, 15th mo. •O less $2, cash & carry. •P less 2%, 15 days. •Q per ton. •R revised. •S add .10/bag under 200 bags. •T 5000# quantity on 4000# skids. •U 30 Msf quantity; $0.245 in 10 Msf quantity. •X per sq ft. •Y per sheet. •Z 6,000 lb or over. •AA 30,000 sf or over.

Bid Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

BUILDINGS—BA

▲ **Conn., Stamford**—BA 8/8—Town, Bd. Educ., 151 Broad St., Turn-of-River Junior HIGH SCHOOL, Vine Road, $3,100,000. Sherwood, Mills & Smith, 65 Broad St., Stamford, Conn., archts. Tizian Assocs., 567 Summer St., Stamford, Conn., engrs. CD 5/17/61.

BUILDINGS—LB & CA

▲ **Franchi Constr. Co., Inc.**, 429 Watertown St., Newton, Mass., LB **$2,411,759**, GYMNASIUM and SKATING RINK, BURLINGTON, VT. University of Vermont, State Agricultural College, BURLINGTON, VT. BA 5/15/61. CD 5/24/61.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **N. Y., Flushing** — BA 7/6 — Comr. Parks, Arsenal Bldg., Central Park, 64 St. and 5 Ave., New York, Zone 1, Contr. Q-991-161 (1) constr. basic roadways and utilities; (2) Contr. Q-99-361, underground electrical and communication conduit sys. for PERMANENT PARK USE incl. temporary New York World's Fair 1964-1965 constr., Flushing Meadow Park, Queens Boro. Plans deposit $100 each. CD 10/22/48.

▲ **N. Y., Rochester**—BA 7/6—Monroe County Water Auth., 339 East Ave., 6 mi. West-side WATER TRANSMISSION MAIN. $2,000,000-$3,000,000. Plans deposit $25. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROAD,
Grow Constr. Co. Inc., Andrew Catapano Co. Inc. and **A. J. Orlando Contg. Co. Inc.**; 313 W. 53 St., New York 19, N. Y., CA **$9,546,403** est. $12,589,000 c. conc. pavement, b. conc. embankment surcharge, plate girder, comp. beam bridges equestrain underpass overpass, simple beam, 4 level structure plate girder, 3.83 mi. Interstate Rte. Conn. Clearview Expressway (Hillside Ave. to 73 Ave.) Van Wyck Expressway Extension (57 Ave. to Union Turnpike) Proj. EI 78-1 (61) U 1085(19) Contr. FIC 61-1, FAVWE 61-1, Queens Co. BA 4/27 CD 5/3/61 under LB.

BUILDINGS—LB & CA

▲ **H.R.H. Constr. Corp.**, 579 5 Ave., New York, N. Y., CA **$7,000,000**, 12 story OFFICES ADDN. to 8 story bldg. and alterations, NEW YORK, N. Y. 50 W. 44 St. Bldg. Corp., 50 W. 44 St., New York 19, N. Y. BA 6/1. CD 6/8/61, under LB.

▲ **Belli Co.**, 2137 Hamilton Ave., Trenton, N. J., LB **$4,770,000**, est. $10,000,000 (6 bidders), 14 story OFFICE for State Department of Labor and Industry, John Fitch Way, TRENTON, N. J. State Division of Purchase & Property, State House, Trenton, Zone 25, N. J. BA 6/15/61. CD 5/4/61.
Frank McBride Co., 75 Spring St., Paterson, N. J., LB **$2,194,232** (5 bidders), heating, ventilating contract, 14 story OFFICE for State Department of Labor and Industry (Trenton, N. J.).
Casey Electrical Co., 460 Colfax Ave., Clifton, N. J., LB **$1,297,000** (4 bidders), electrical contract, 14 story OFFICE for State Department of Labor and Industry (Trenton, N. J.).
Richardson Engineering Co., 90 Jersey Ave., New Brunswick, N. J., LB **$417,720** (5 bidders), plumbing contract, 14 story OFFICE for State Department of Labor and Industry (Trenton, N. J.).
Bethlehem Steel Co., 701 E. 3rd St., Bethlehem, Pa., LB **$1,124,000** (3 bidders), structural steel contract, 14 story OFFICE for State Department of Labor and Industry (Trenton, N. J.).
Haughton Elevator Co., 233 Woodland St., Toledo, O., LB **$593,343** (3 bidders), elevator contract, 14 story OFFICE, for State Department of Labor and Industry (Trenton, N. J.).

▲† **John McShain, Inc.**, 17th & Spring Garden Sts., Philadelphia 30, Pa., LB **$17,422,000** base bid, 700 bed HOSPITAL, WASH., D. C. Veterans Administration, Munitions Bldg., Wash., D. C. BA 6/16/61. CD 6/13/61.

▲ **Leeds Hotels, Inc.**, c/o Owner, CA Est. **$7,000,000**, 21 story, 352 unit MOTOR HOTEL to be known as International Inn, 10 Thomas Circle, WASH., D. C. Bernard Buccholz, Samuel Leeds and International Inn, 33 N. LaSalle St., Chicago, Ill. Morris Lapidus, Harle & Liebman, 940 Lincoln Rd., Miami Beach, Fla., archts.

SOUTH

HEAVY CONSTRUCTION—BA

▲ **Virginia**—BA 7/19—Elizabeth River Tunnel Comn., City Council Chamber, City Hall Bldg., 235 East Plume St., Norfolk, Contract 3, Second Elizabeth River Tunnel, INTERCHANGE to local city streets, incl. off and on RAMPS; constr. GRADE SEPARATION STRUCTURES, constr. SERVICE ROADS, RELOCATING CITY STREETS, constr. DRAINAGE FACILITIES, CULVERT STRUCTURES, GUARD RAIL and FENCES, topsoiling, seeding and planting, all in vicinity of Norfolk. Plans deposit $35. Parsons, Brinckerhoff, Quade & Douglas, 165 Broadway, New York, Zone 6, N. Y., engrs. CD 11/25/59.

BUILDINGS—BA

▲ **Ga., Atlanta**—BA 7/11—Georgia Baptist Hospital, 300 Boulevard Ave. N.E., Atlanta, 12 story NURSES DORMITORY. $2,500,000. Plans deposit $50. Stevens & Wilkinson, 157 Luckie St. N.W., Atlanta, Ga., archts. CD 4/1/60.

HEAVY CONSTRUCTION—LB & CA

▲ **LOUISIANA**—State Dpt. Hys., Rm. 426, Headquarters Admin. Bldg., Baton Rouge, ROAD,
Campbell Constr. Co., foot of Milam St., Shreveport, La., CA **$3,714,984**, c. conc. pavt. 6.744 mi. Ada-Arcadia Hy. (Ada-Gibsland) Rte. I-20. SP 451-04-03 FAP 1-20-212-54, Bienville Parish. BA 4/26 CD 5/3/61 under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲ **McShane Contracting Corp.**, 345 Mt. Lebanon Blvd., Pittsburgh, Pa., LB **$1,196,000**, est. $1,000,000 (1 bidder) SEWER IMPRVT., 10S Contr. C, PAINESVILLE, O. Lake County Comnrs., Court House, Painesville, O. BA 6/15/61. CD 5/18/61.
S & W Constr. Co., 4614 Prospect Ave., Cleveland 15, O., LB **$900,000**, est. $760,000 (4 bidders) SEWER IMPRVT., 10 S, Contr. B, (Painesville, O.).
E. A. Taylor & Son Constr. Co., New Lexington, O., LB **$340,000**, est. $325,000 (3 bidders) SEWER IMPRVT., 10 S, Contr. A, (Painesville, O.).

▲ **S. A. Healy**, 47th and East Sts., McCook, Ill., CA **$1,852,585**, est. $1,350,000, 7,106 ft. MAIN DRAIN, South Rte. Expressway, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. CD 5/25/61 under LB.

BUILDINGS—LB & CA

▲ **Alvin Homes**, 18009 Holland Road, Berea, O., Owner Builds, **$4,000,000**, 276 HOMES, Penns Woods Estates, BEDFORD HEIGHTS, O. CD 2/15/61.

▲ **Sam W. Emerson Co., 1836 Euclid Ave., Cleveland** 15, O., CA total est. **$3,500,000** (3 bidders), general contract, 301,000 sq. ft. PLANT ADDN., CLEVELAND, O. Addressograph Multigraph Corp., 1200 Babbitt Rd., Cleveland 32, O. **BA 6/8/61. CA 6/14/61. CD** 5/16/61.
Reliance Co., 4975 Hamilton Ave., Cleveland 14, O., CA (4 bidders), mechanical contract, **PLANT ADDN.** (Cleveland, O.).
W. W. Clark Corp., Engineers Bldg., **Cleveland, O.**, CA (3 bidders), electrical contract PLANT ADDN. (Cleveland, O.).

▲ **Fifty Star Homes**, P.O. Box 335, Kent, O., Owner Builds, **$7,000,000**, 700 HOMES, Jefferson Meadows, 313 acres, Rte. 46, JEFFERSON, O.

▲ **Omega Constr. Co., 2435 Eastern St. S.E., Grand** Rapids, Mich., CA **$2,536,871**, SENIOR HIGH SCHOOL, FRANKFORT, IND. Community Schools of Frankfort, Ind., Units 1, 2, 3 and 4, and Frankfort Community School Bldg. Corp., Units 5, 6, 7 and 8, **Frankfort,** Ind. CD 5/12/61, under LB.

▲ **Becker Constr. Co.**, 7701 W. Blue Mound Rd., Milwaukee, Wis., CA **$2,824,452**, DISTRICT STATE OFFICE, MILWAUKEE, WIS. State Pub. Bldg. Corp., Capitol Bldg., Madison, Wis. BA 4/19/61. CD 4/25/61, under LB.
Zien Plumbing & Heating Co., 4450 N. Oakland Ave., Milwaukee, Wis., CA **$782,483**, plumbing, fire protection, heating, air-conditioning for DISTRICT STATE OFFICE (Milwaukee, Wis.).
Staff Electric Co., 1659 N. Jackson St., Milwaukee, Wis., CA **$517,482**, electric contract for DISTRICT STATE OFFICE (Milwaukee, Wis.).

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲† **Arkansas**—BA On Or About 9/6—U. S. Eng., 300 Broadway, Little Rock, POWERHOUSE and SWITCHYARD at Greers Ferry Dam, Little Red River, located Greers Ferry Dam on Little Red River in Cleburne County, approx. 3 mi. northeast of Heber Springs, approx. 50 mi. northeast of Little Rock, CIVENG-03-050-62-1. $5,000,000. CD 9/20/60.

BUILDINGS—BA

▲† **Tex., Fort Sam Houston**—BA 7/19—U. S. Eng., 606 Santa Fe Bldg., Galveston, 840 units REMODELING FAMILY HOUSING, Sam Houston Villages, No. 1 and No. 2, ENG-243-61-39. $1,500,000. Extended date. Plans deposit $10. Noonan, Krocker & Rogers, 2002 N. St. Marys St., San Antonio, archts. CD 6/14/61.

▲† **Mont., Great Falls**—BA On Or About 7/20—Base Procurement Office, Malmstrom Air Force Base, Great Falls, 260 unit ARMED SERVICES HOUSING Project, Malmstrom Air Force Base, No. 24-604-61-71. Plans deposit $100. CD 2/19/59.

▲ **Wyo., Casper**—BA 7/20—Casper School Dist., Casper, JUNIOR HIGH SCHOOL. $1,750,000. Robert Wehrli, 109 E. 2nd St., Casper, Wyo., archt. CD 12/15/60.

HEAVY CONSTRUCTION—LB & CA

▲ **R. H. Fulton & Co.**, 2323 Erskine Rd., Lubbock, Tex., CA **$2,550,000**, 170 mi. 8 in. CRUDE LINE, Laverne to Newalla, OKLAHOMA. Sinclair Pipeline Co., 909 S. Boston St., Tulsa, Okla. CD 10/28/53.

BUILDINGS—LB & CA

▲ **Lyell C. Halverson Co.**, 1409 Willow St., Minneapolis, Minn., CA total est. **$12,000,000** ADVERTISING and GRAPHIC ARTS CENTER incl. 20 to 25 bldgs. Medinine Lake Rd. and Northfield and Southern RR tracks, GOLDEN VALLEY (P.O. MINNEAPOLIS), MINN. Borlem Investment Co., c/o R. L. Krause, Inc., Northwestern Bank Bldg., Minneapolis, Minn. Hammel & Green, Inc., 2650 University Ave., St. Paul, Minn., archt.

▲ **Kubatzky-Shackleton Constr. Co.**, 8890 Lackland Rd., Overland 14, Mo., CA Est. **$3,500,000**, three bldg., multi-storied, 257-room HOTEL, glass-enclosed walks, swimming pool, Natural Bridge and Brown Rds., BERKELEY (ST. LOUIS 34, P.O.), MO. Theodore O. Kubatzky, 41 Oak Park Dr., Creve Couer 41, Mo. Wyatt Hedrick, T & P Bldg., Fort Worth, Tex., archt. Ramada Inn Corp., Phoenix, Ariz., lessee. CD 5/6/59, under Mo., St. Louis County.

▲ **M. W. Kellogg Co.**, 711 3rd Ave., New York, N. Y., CA **$12,000,000**, PETROCHEMICAL PLANT, to manufacture acetylene Ship Channel, HOUSTON, TEX. Tenneco Chemical Co. (subsidiary of Tennessee Gas Transmission Co.), Tennessee Bldg., Houston, Tex. CD 3/1/61.
Bechtel Corp., 220 Bush St., San Francisco, Calif., CA **$1,500,000**, off-site constr., for plant (Houston, Tex.).

▲† **Foley Bros. Inc.** and **Holland Constr. Co.**, 900 New York Bldg., St. Paul 1, Minn., CA **$7,917,170**, FONTENNELLE DAM, Seedskadee Project WYOMING, Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. BA 5/25/61. CA 6/12/61. CD 5/31/61 under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **Washington**—BA 7/20—U. S. Eng., City-County Airport, Walla Walla, thirteen, 212,400 hp. Kaplan-type HYDRAULIC TURBINES for Lower Monumental and John Day Dams, Inv. 61-46. Over $10,000,000. Extended date. CD 5/9/61.

▲ **Calif., Los Angeles**—BA 7/12—Los Angeles Sanitation Dist. No. 2, 2020 Beverly Blvd., Whittier Narrows WATER RECLAMATION PLANT, settling tanks and appurtenances, Whittier. $1,500,000. CD 3/20/61.

BUILDINGS—BA

▲ **Calif., Hanford**—BA 7/3—Dominican Sisters of the Third Order of St. Dominic, Inc., 1025 N. Douty St., (selected list bidders) 4 story, bsmnt. rein.-conc., gravel roof on concrete decking 125-bed Sacred Heart HOSPITAL ADDN. $3,200,000. Maguolo & Quick and Frank W. Trabucco, 355 Stockton St., San Francisco, Calif., archts. Ellison Sedgwick & Assoc., 1045 Sansoms St., San Francisco, Calif., engrs. CD 8/11/60.

▲ **Calif., Oakland**—BA 7/18—Alameda Co., Courthouse, 5 story, basmnt. 186,000 sq. ft. concrete frame, rein.-con. columns, concrete precast panels County ADMINISTRATION BLDG. $4,500,000. Plans deposit $100. Ratcliff, Siama & Cadwalader, Berkeley & Van Bourg, Nakamura Assoc., 2286 Fulton St. Berkeley, Calif., archts. H. J. Brunnier, 55 New Montgomery St., San Francisco, Calif., engr. CD 7/1/59.

HEAVY CONSTPUCTION—LB & CA

▲ **UTAH**—State Rd. Comn., State Office Bldg., Salt Lake City, Zone 14, ROAD,
W. W. Clyde, Springville, Utah, CA **$2,271,998**, 6.617 mi. plant mix bit. surf. road and seven 20 ft. span structures between Peterson and Stoddard on Interstate Hy. 80 N., Morgan Co. BA 5/2/61. CA 5/17/61. CD 5/5/61 under LB.

▲ **General Constr. Co.**, 3840 Iowa, Seattle, Wash., CA **$6,181,000**, first section Eastside Interceptor SEWER and influent and effluent lines for Renton treatment plant, SEATTLE, WASH. Municipality of Metropolitan Seattle, 152 Denny Way, Seattle, Wash. BA 6/1/61. CA 6/15/61. CD 6/5/61, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 6/15, ROAD,
Griffith Co., 1060 S. Broadway, Los Angeles, Calif., LB **$10,987,901** (7 bidders), grading, paving to constr. 4.8 mi. 8 lane freeway, San Diego Freeway between 137 St. in Hawthorne and 0.2 mi. northwest of La Tijera Blvd., Los Angeles, incl. 25 structures, Los Angeles Co. CD 5/3/61.

BUILDINGS—LB & CA

▲ **Del E. Webb Corp.**, South 23rd Ave., Phoenix, Ariz., Owner Builds, **$20,000,000** (1st year $5,000,000), 17 story Rosenzweig Center OFFICE, 3600-3000 North Central Ave., PHOENIX, ARIZ.

▲ **Brown-Boveri**, Baden Switzerland LB **$4,398,715** alternate 1-C (6 bidders) two STEAM TURBINE GENERATORS, Haines Steam Plant. Spec. 7535, LOS ANGELES, CALIF. Los Angeles Water & Power Dpt., 311 S. Spring St., Los Angeles, Calif. CD 11/20/56.

▲ **Duc & Elliot Development Co.**, 3749 Stevens Creek Rd., San Jose, Calif., Owner Builds **$5,600,000**, 400 HOMES Kingston Homes Subdivision, MILPITAS, CALIF.

▲ **Williams & Burrows Inc.**, 500 Harbor Blvd., Belmont, Calif., CA **$3,706,000** four-1 story 182,000 sq. ft. Crestmoor HIGH SCHOOL, two swimming pools, San Bruno, SAN MATEO, CALIF. San Mateo Union High School Dist., 650 N. Delaware, San Mateo, Calif. BA 5/23. CD 6/2/61, **under LB.**

▲ **Nick Prokrajak**, 319 N. Santa Anita Ave., Arcadia, Calif., LB **$1,063,000** est. $1,062,000 (6 bidders) brick and concrete John Muir HIGH SCHOOL ADDN. PASADENA, CALIF. Pasadena Bd. Educ., 351 S. Hudson Ave., Pasadena, Calif. BA 6/15. CD 6/5/61.

CANADA

HEAVY CONSTRUCTION—BA

▲ **QUEBEC**—BA 7/20—Provincial P. Wks. Dpt., Parliament Bldgs., Quebec City, BRIDGE,

Montreal—steel superstructure for span at Honore Mercier bridge, aprox. 1,400 ft. downstream from C. P. R. bridge. Total est. $9,000,000. Plans deposit $200. Lalonde & Valois, 615 Belmont St., Montreal, engrs. CD 12/17/59.

▲ **Alta., Edmonton**—BA 7/27—Dpt. Transport, Hunter Bldg., Ottawa, Ont., AIR TERMINAL with 3 story central block and parking and approaches above multi-story office block, Edmonton International Airport. $10,000,000. Plans deposit $450. Rensaa & Minsos, 9130 Jasper Ave., Edmonton, archts. CD 6/2/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Dutton Williams Bros. Ltd.**, North Canadian Oil Bldg., Calgary, Alta., CA Total Est. **$35,000,000**, 362 mi. 12 in. OIL and NATURAL GAS LINE, Kamloops to Prince George Area, BRITISH COLUMBIA. Westcoast Transmission Co., Ltd., 424 Burrard St., Vancouver, B. C. CD 1/14/57.

Canadian Bechtel Ltd., 320 9th Ave. S.W., Calgary, Alta., CA, 142 mi. OIL and NATURAL GAS LINE. Prince George Area to Taylor (British Columbia).

Alberta Phoenix Tube & Pipe Ltd., Bentall Bldg., Calgary, Alta., CA, steel for GAS LINE (British Columbia).

Page Hershey Tubes Ltd., 909 Lancaster Blvd., Calgary, Alta., CA, PIPE for GAS LINE (British Columbia).

▲ **Canada Cement Co., Ltd.**, Phillips Sq., Montreal, Que., CA **$4,035,500**, CEMENT for HYDRO ELECTRIC DEVELOPMENT, Grand Rapids, MANITOBA, Manitoba Hydro-Electric Bd. P.O. Box 815, Winnipeg, Man. CA 6/15/61. CA 2/8/60.

BUILDINGS—LB & CA

▲ **G. M. Gest Ltd.**, 128 Elmslie St., Montreal, Que., CA Est. **$6,000,000**, CONCENTRATING MILL, part of iron-ore beneficiating plant, Carol Lake Mining Development, CAROL LAKE, LABRADOR, Iron Ore. Co. of Canada, 810 Cote de Liesse Rd., Montreal, Que. BA 5/19/61. CD 5/17/61.

▲ **Perini Ltd.**, 49 Jackes Ave., Toronto, Ont., CA **$6,713,077**, 15 story, concrete, steel, precast concrete, granite stone ADMINISTRATION Bldg. for Health and Welfare Dpt., Tunneys Pasture, OTTAWA, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. BA 3/8/61. CD 3/14/61, **under LB.**

▲ **Paul Rolland Constr. Ltee**, 5890 Monkland Ave., Montreal, Que., CA Est. **$1,200,000** (9 bidders), 6 story HOSPITAL, conc., brick, rein.-con., hot water heating, Bellechasse St. E. near 21st Ave., MONTREAL, QUE. Bellechasse Hospital Corp., c/o Jean Paul Jolicoeur, archt., 5220 Mentana St., Montreal, Que. BA 3/21/61. CD 3/15/61.

PUERTO RICO

HEAVY CONSTRUCTION—BA

▲ **Puerto Rico, San Juan**—BA 7/3—Sears, Roebuck & Co., c/o Weed-Johnson Assocs., archts., 550 Brickell Ave., Miami, Fla., U. S. A. (selected list bidders) RETAIL STORE and WAREHOUSE. $2,000,000. Extended Date. John S. Redden, 925 S. Homan Ave., Chicago, Ill., U. S. A., consult. archt. H. J. Ross & Assocs., 1735 Biscayne Blvd., Miami, Fla., U. S. A., engrs. CD 6/5/61.

BUILDINGS—LB & CA

▲ **Metropolitan Builders, Inc.**, P.O. Box 9004, Santurce, Puerto Rico CA Est. **$4,000,000**, 202-room HOTEL Dorado Riviera, DORADO, PUERTO RICO. George Silas, c/o Leo Kornblath, archt., 18 E. 41 St., New York, 17, N. Y. CD 3/17/61.

▲ **Metropolitan Builders, Inc.**, P.O. Box 9004, Santurce, Puerto Rico CA Est. **$13,000,000**, 16 story 450-room HOTEL, SAN JUAN, PUERTO RICO. Leow's Theaters, Inc., 1540 Broadway, New York, N. Y. CD 4/27/61.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Netherland West Indies, Aruba**—BA 8/8—P. Wks. Dpt., Oranjestad, Aruba, INDUSTRIAL HARBOR near Pakietenbos, south coast of Aruba. Over $6,000,000. Plans deposit $26.80. CD 12/7/49.

HEAVY CONSTRUCTION—LB & CA

▲ **Sogreah ET CIE**, Grenoble, France, CA **$5,213,000**, est. $5,000,000, PORTABLE WATER SUPPLY for San Antonio Oeste and INDUSTRIAL SUPPLY for San Antonio Bay (port), Rio Negro, VIEDMA, ARGENTINA. Provincial Govt. Rio Negro, Viedma, Argentina.

BUILDINGS—LB & CA

▲ **Hudson Engineering Corp.**, 5900 Hillcroft, Houston, Tex., U.S.A., CA Est. **$5,500,000**, design and construct FACTORY to manufacture natural gas at Catu, Bahia, BRAZIL. Petroleo Brasileiro, S.A., Praca Pio X, Rio de Janeiro, Brazil.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **Morrison-Knudsen Co. of Africa, Ltd.** (subsidiary of Morrison-Knudsen Co., Inc., 319 Broadway Ave., Boise, Idaho, U.S.A.), CA **$5,700,000**, ENLARGED AIRFIELD FACILITIES involving 10,000 ft. long runway, paralleling taxiway and parking aprons designed for jet aircraft operations, nearly 140,000 cu. yd. concrete paving, etc., at El Aouina International Airport near here, TUNIS, TUNISIA. Govt. Tunisia, Monsieur-LATITI Moktar, Ingenieur en Chef des Chaussees, Secretariat d'Etat aux Travaux Publics et a Habitat, Cite-Jardins, Tunis, Tunisia. CD 9/22/60.

BUILDINGS—LB & CA

▲ **Badger Mfg. Co.**, 363 Third St., Cambridge, Mass., U. S. A., CA 15,000 long tons per year PHTHALIC ANDHYRIDGE PLANT, HULL, ENGLAND. Grange Chemicals Ltd. (British Hydro-Carbon Chemicals Ltd. and California Chemicals Ltd., 30 Rockefeller, Plaza, New York, N. Y., U. S. A.) Devonshire ho, Piccadilly WI, London, England.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ala., Cullman**—Cullman Co. Bd. Revenue, Courthouse, county-wide WATER DISTRIBUTION SYSTEM, **$5,000,000.**

▲ **Colo., Denver**—Bd. Water Comrs., 144 West Colfax Denver, Conduit No. 27 to go ahead 1965, **$6,000,000**, CD 10/9/59; 12,000 lin. ft. 72 in. extension of Conduit. No. 28 Part No. 4, Hillcrest Reservoir to Monaco & Smith Road, **$1,126,784.** R. B. McRae, 144 West Colfax, Denver, Colo. engr.

UNCLASSIFIED

▲ **N. Y., Flushing**—Chrysler Corp., Admin. Bldg., 341 Massachusetts, Highland Park, Mich., 129,987 sq. ft. WORLD'S FAIR EXHIBIT. Over **$1,000,000.**

▲ **N. Y., Flushing**—Power & Light Exhibit Inc., c/o Edison Electric Institute, 750 3 Ave., New York 17, N. Y., 80 ft. tall, circular shaped TOWER of LIGHT with 24-1 m. candlepower light cannons', World's Fair Exhibit for electric industry. **$6,000,000-$7,000,000.** V. E. K. Assocs. Inc., 600 5 Ave., New York 20, N. Y., design consultant. CD 1/5/61.

PUBLIC BUILDINGS

▲ **Colo., Boulder**—National Science Foundation, 1951 Constitution Ave. N.W., Wash., D. C., SCIENCE LABORATORY (National Center of Atmospheric Research), 500-acre site, near Kohler Reservoir near here approx. **$40,000,000** (no. appro.)

▲ **Ga., Atlanta**—Norris P. Burns, 1731 Carter Circle, East Point, plans by Finch, Alexander, Barnes, Rothschild & Paschal, 70 Fairlie St., N. W., APARTMENT, Grandview Ave. and Pharr Rd., N. E. **$4,000,000.**

▲ **La., New Orleans**—City, City Hall, plans by Mathes, Bergman & Assocs., 929 Howard, (P-La-3087) CULTURAL CENTER, air conditioning to existing city auditorium. **$18,500,000.**

▲ **Mich., Oak Park**—Bd. Educ., 13900 Granzon Ave., voted bonds June 12, JUNIOR HIGH SCHOOL and two ELEMENTARY SCHOOL ADDNS. **$3,500,000.** CD 5/18/61.

▲ **Mich., Warren**—Warren Consolidated Schools, 5460 Arden Ave., voted **$3,800,000** bonds June 12, JUNIOR HIGH SCHOOL and three ELEMENTARY SCHOOLS. Beyster & Assocs., 9154 Woodward, Detroit 2, Mich. archt., High School. Wakely-Kushner Assocs., 21429 Mack Ave., St. Clair Shores, Mich., archts., Elementary Schools. CD 3/22/61.

COMMERCIAL BUILDINGS

▲ **Conn., Bridgeport**—Hyman & Irving Shapiro, 20 E. 46 St., New York 17, N. Y., plans by Herbert & Clarence Lilien, 1841 Broadway, New York 23, N. Y., 11 story, 250 units APARTMENT East Side Park Ave., North of Benson St. **$3,000,000.**

▲ **Fla., Lake Wales**—National Letter Carriers Assocs., 100 Indiana Ave. N.W., Wash., D. C., RETIREMENT VILLAGE, 500 apartment units, shopping center, infirmary, etc. **$4,500,000.**

▲ **Idaho, Boise** — Idaho Retirement Foundation, Inc., 1106 State St., plans by Wayland & Cline, Idaho Bldg., 4 story, 104,150 sq. ft., concrete, steel, glass APARTMENT for RETIRED PERSONS. **$2,000,000.** Marque, Lyle & Assocs., Realty Bldg., Spokane, Wash., mech.-elec. engrs.

▲ **Ill., Chicago**—United States Gypsum Co., 300 W. Adams St., plans by Perkins & Will, 309 Jackson Blvd., 17 story OFFICE Wacker Dr. and Monroe Sts. Bids soon. **$7,000,000.**

▲ **Mo., Mehlville (St. Louis 29, P.O.)** — Fischer & Frichtel, Inc., 8703 St. Charles Rock Rd., Overland, Zone 14, 750 RESIDENCES, roads, walks, sewers, Hy. 21, Mattis School, Kerth and Butler Hill Rds. in St. Louis Co., **$7,500,000.**

▲ **Tenn., Knoxville**—Embassy Towers, Inc., c/o Tom T. Pace, Hamilton Bank Bldg., Knoxville, plans by Martin & Adams, 3355 Poplar Ave., Memphis, 125 units APARTMENT, **$2,000,000.**

▲ **Tex., Mesquite**—Danna Constr. Co., 5526 Dyer St., Dallas, 183 DWELLINGS, Broadmoor Addn., **$2,250,000.**

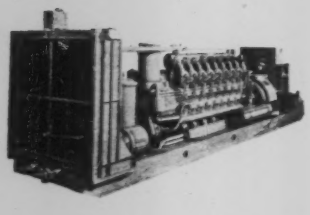
INDUSTRIAL BUILDINGS

▲ **Ind., Petersburg**—Hoosier Cooperative Energy Inc., Osgood, 198,000 kw. STEAM GENERATING PLANT, 1,500 mi. 154 kv and 69 kv TRANSMISSION LINES and SUBSTATIONS. **$60,225,000.** REA loan made.

▲ **Alta., Red Deer**—Group of Business Firms headed by Canadian Superior Oil of California Ltd., 703 6th Ave. S.W., Calgary, CONDENSATE GAS RECOVERY PLANT, Harmattan-Elkton Field. **$4,300,000.**

FOREIGN

▲ **Iraq, Baghdad**—Govt. of Iraq, Baghdad, RAYON PLANT, Hindiya Barrage, near here. **$22,400,000.** Bids late Summer 1961. Ing Maurer S.A. Berne, Switzerland, consult. engr., will design and supervise construction.



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Unclassified

Private
State & Municipal
Federal

Names and addresses of

Owners, public or private
Engineers
Architects
Architect-Engineers
Contractors
Designer-Builders
Owner-Builders

These sizes of construction projects:

All reports are screened in the field to select projects of these *minimum sizes* per project:

	Minimum
Waterworks, Earthwork, Irrigation, Waterways	$53,000
Other Public Works and Private Unclassified	88,000
Industrial Buildings	110,000
Public, Commercial Buildings, Mass Housing	400,000

CD Covers These Major Subjects

Appropriations for Construction
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  Volume
  Trends
  Forecasts
Building Cost Trends & Forecasts
Built-in Wage Increases in Labor Contracts
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Construction Contracts
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  Trends & Forecasts
Construction Projects
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Prices, Building Materials
  Construction Materials
Public Works
  In design stage
  Going under construction contract
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  Bond Elections
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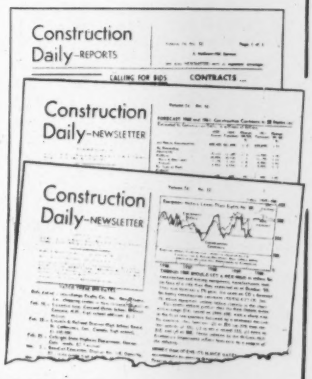

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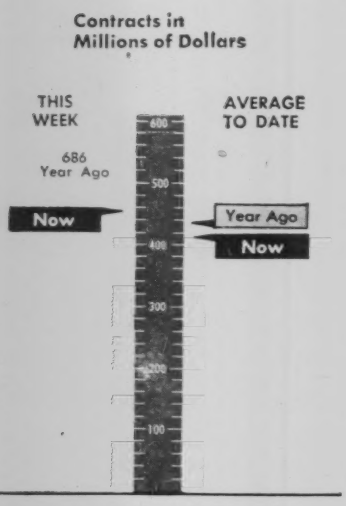
Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

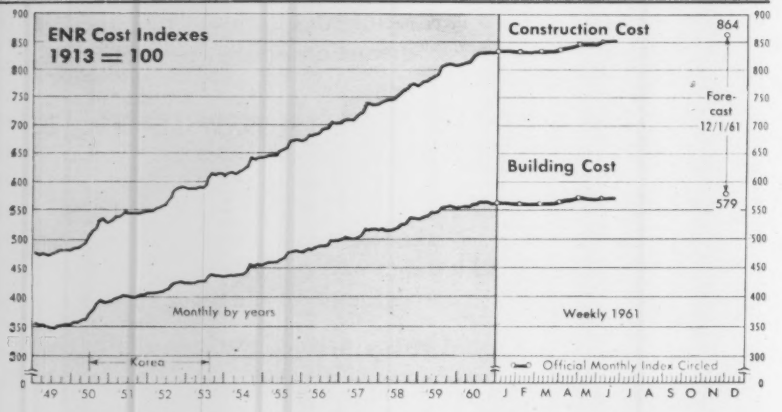
Contracts Awarded In 50 States By Type	This Week millions	Cum. 26 wks 1961	Chge '60-'61 %
All Heavy Construction	$456.7	$10,929.9	− 2
By Ownership			
PRIVATE	177.2	5,480.3	− 7
PUBLIC	279.5	5,449.6	+ 4
State & Municipal	230.8	4,152.2	+ 6
Federal	48.7	1,297.4	+0.4
By Type of Work			
PUBLIC			
Waterworks	10.6	192.1	−19
Sewerage	22.8	370.0	+27
Bridges*	11.7	283.3	−28
Highways	111.3	1,834.3	+14
Earthwork, Dams & Waterways	13.7	447.8	+ 4
Buildings:			
Excl. Housing	74.5	1,294.9	+ 9
Housing	13.8	405.4	+34
Unclassified	21.0	616.8	−20
PRIVATE			
Buildings:			
Mass Housing	96.3	2,440.7	−16
Commercial	56.8	1,290.6	+11
Industrial	20.9	1,522.4	+18
Unclassified	3.3	226.6	−55

* Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of June 22 millions	Cum. 25 wks 1961	Chge '60-'61 %
Corporate Securities	$ 60.4	$1838.5	+24
State and Municipal:			
All Except Housing	164.9	3,286.5	− 3
Housing	0	31.3	−83
Federal Loans	60.4	163.6	+122
Federal Aid	0	0	−100
Total Nonfederal	$285.3	$5,319.8	−32
Federal Appropriations:			
Projects in U.S.	0	1.0	− 1
Outside U.S.	0	0	−100
Total New Capital	$285.3	$5,320.8	−34


ENR Cost Indexes
1913 = 100
Construction Cost
864
Fore-cast 12/1/61
Building Cost
579
Monthly by years
Weekly 1961
Korea
Official Monthly Index Circled
49 50 51 52 53 54 55 56 57 58 59 60 J F M A M J J A S O N D

ENR INDEXES (1913 = 100), 20-cities' average	Week of June 22 1961	% Change from May 25 1961	% Change from June 23 1960
Construction Cost	852.30	+0.5	+3.2
Building Cost	570.97	+0.3	+1.8

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest Month . . .

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	May 1961 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (ENR reported)	$124,962	+0.002	+1.7
By Ownership—			
Private	56,376	+0.2	+2.9
State & Municipal	54,544	−0.1	+1.4
Federal	14,042	−0.6	−2.1
By Type of Work—			
Waterworks	3,081	+0.02	+6.1
Sewerage	4,240	−0.2	+8.2
Bridges	3,279	−2.2	−2.2
Highways	13,382	−4.9	−3.1
Earthwork, Dams and Waterways	11,993	+0.7	+0.5
Public Buildings	22,771	−0.3	+2.6
Industrial Buildings	17,456	+0.03	−1.1
Commercial Buildings	28,147	+0.6	+6.2
Unclassified, Private	10,773*	−0.3	+1.4
Unclassified, Public	9,840	−0.5	−1.8

* Includes Private Bridges, $101 million

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1961 May (millions)	1961 5-months (millions)	Percent Change from 1960 May	Percent Change from 1960 5-Mos.
Total U. S. (ENR reported)	$1,437	$8,759	−24	−18
By Ownership—				
Private	878	5,051	−13	−15
State & Municipal	526	3,351	−22	−19
Federal	33	357	−84	−47
By Type of Work—				
Waterworks	18	355	−53	+107
Sewerage	42	359	−24	+26
Bridges	9	143	−80	+ 2
Highways	140	567	−22	−61
Earthwork, Dams and Waterways	115	148	+423	+75
Public Buildings	218	1,894	−30	− 6
Industrial Buildings	272	1,587	−44	− 1
Commercial: Mass Housing	273	1,431	−24	−50
Other Building	322	1,643	+130	+37
Unclassified, Private	11	390	−50	+61
Unclassified, Public	17	242	−93	−61

FLOW OF PROJECTS OUT OF THE BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	959	4,524	− 5	+ 7
By Ownership—				
Private	482	1,860	+26	+13
State & Municipal	368	1,985	−23	+ 6
Federal	109	679	−28	− 3

Housing Outlook Still Uncertain

Most forecasts made cautiously; positive predictions only for apartment construction: "Strong, but . . ."

With half of 1961 now history, many homebuilding authorities still balk at crawling too far out on the limb when it comes to forecasting housing results for the full year.

Their diverse opinions are best summed up by Norman Strunk, executive vice president of the United States Savings and Loan League. He says: "The degree of forward thrust in 1961's homebuilding market continues uncertain . . . most analysts see only moderate expansion ahead."

Predictions couched in cautious terms predominate—"About the same as last year," "No better than last year," "A modest improvement over last year." On only one segment of the market do economists and building executives speak with certainty and optimism—apartment buildings. This sector of the market will be strong. But even over this market a caution light glows; over-building poses a threat in some areas.

In terms of the total housing market, exuberant predictions come from only two sections of the nation—the Dallas metropolitan area and southern California.

In Dallas and 40 surrounding counties, housing sales will set an all-time record, according to Ellis H. Charles, Federal Housing Administration district director. "In May alone, we had a total of 2,003 loan applications, a few more than in March, which usually is the biggest month for applications," he says. During the January-May period, his office received 2,000 more applications than in same period last year. Should Mr. Charles' prediction prove accurate, it would mean Dallas-region housing starts of more than 17,000, the record number scored in 1955.

Southern California also expects an extremely good year; not a record, but a "near record." The Building Contractors Association of California reports that contractors expect to build about 50% more housing units this year than last. The trend within the market also shows, one that is now clear in other parts of the nation. The swing is to apartment buildings.

Members of the California group estimate a 100% increase in production of apartment units compared to a 37% increase in single-family housing.

The same trend appears in the Midwest. Advance Mortgage Corp. of Detroit, a major mortgage banking firm, reports that in 10 midwestern cities the 5,680 starts on multiple-family living units represents 22% of all housing starts in the first quarter. (Cities covered are, Detroit, Grand Rapids, Chicago, Milwaukee, Indianapolis, Toledo, Cleveland, Columbus, Dayton and Cincinnati.)

The trend toward apartments shows most dramatically in Chicago where first-quarter multiple-unit starts jumped 134% above last year's same period to a total of 3,464 living units. Cleveland scored a larger percentage jump—321%, with multiple-unit starts of 573.

While apartment units were showing strength, single-family housing weakened. Starts in this year's first quarter fell 12% below last year to a total of 18,354 units.

Leslie Rose, executive vice president of Advance, says there will be no upturn in one-family housing in the Midwest before the middle of the upcoming third quarter. "Moreover, I don't expect one-family housing starts in all of 1961 to exceed 1960. Few observers realize the low caliber of potential housing demand," Mr. Rose adds.

He says that in several areas, "a sizable inventory of unsold new houses or repossessed, relatively new, FHA and VA houses overhangs the market." In some regions the inventory amounts to 5% to 10% of an average year's production, Mr. Rose reports.

Apartment unit starts will be a different matter. Mr. Rose anticipates a generous increase in the volume of apartment buildings financed under FHA insuring provisions.

The zip in construction of apartment buildings now puts weight into vacancy-rate data, however. Of 165 areas across the country, 37% report a vacancy rate of 6% or more in multiple-unit buildings, according to a survey just completed by the National Association of Real Estate Boards. One year ago, only 23% of the same 165 areas reported a vacancy rate of 6% or more.

What's more, for the first time since World War II, the number of lower rentals available exceeds that of higher rentals. NAREB says that apartment rents were lower in 24% of the areas this year compared to 13% last year. In 63% of the areas, rentals were unchanged.

The association attributes the rental price shift to "an increase in the number of apartment vacancies," and the longer average duration of the vacancies.

A loss of tenants, combined with higher operational costs sharply reduced yield on residential investment properties in some areas, according to the association. Any continuation of lower yields will eventually act to cut volume of apartment building, but at what point this may occur is difficult to estimate.

The U. S. Census Bureau also has reported a rise in the vacancy rate in rental units. At the end of the first quarter it established a postwar high of 8%.

Data compiled by the same agency show the sharp shift in the market. During most of the 1950s, housing start figures were practically synonomous with single-family homebuilding. Starts on multiple-family units were fairly constant and only a minor part of the housing market. But things have changed; multiple-family units have increased from 10% of total starts in 1955 to more than 25% this year.

Turnpike Extension Plan Falters for Second Time

The Massachusetts Turnpike Authority has failed for the second time to sell bonds to finance construction of an 11.7-mile turnpike extension into Boston. This try was for $183 million; in April, a $177-million bond offering fell with a dull thud.

Public officials and business leaders now think the tollroad extension is dead. Gov. John Volpe supported the project—but reluctantly, and only after it appeared that the $100-million Prudential Center in Boston depended on extending the turnpike.

But when officials of Prudential Insurance Co. said they would go ahead with the commercial complex with or without the turnpike through the tract, Governor Volpe reverted to his first preference—a freeway to the proposed Inner Belt Highway. From this Inner Belt, a one-half-mile access road would be built to the Prudential Center.

The governor now hopes the authority will turn over its engineering studies to the state. Unless an agreement is worked out, 18 to 24 months may be lost before construction starts.

Lower Volume

Orders for new machinery decrease by 9% in April

The inflow of orders for equipment slowed in April. The Construction Equipment New Orders Index dropped 9% below March (see chart), based on reports from companies cooperating with the McGraw-Hill Economics Department, which surveys the equipment manufacturers.

But the index value of 152, in terms of average 1950 monthly volume as 100, was 6% above April 1960.

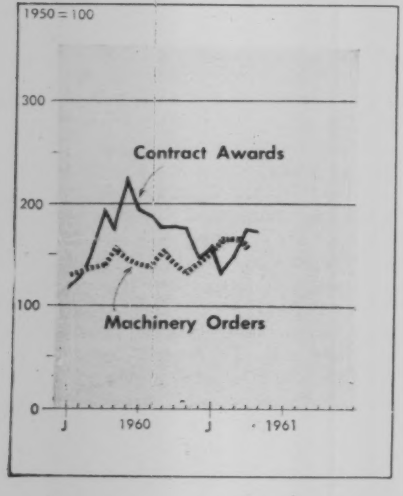
April was the ninth consecutive month that new orders topped a year ago. It also helped lift the four months average 15% above the same period of 1960.

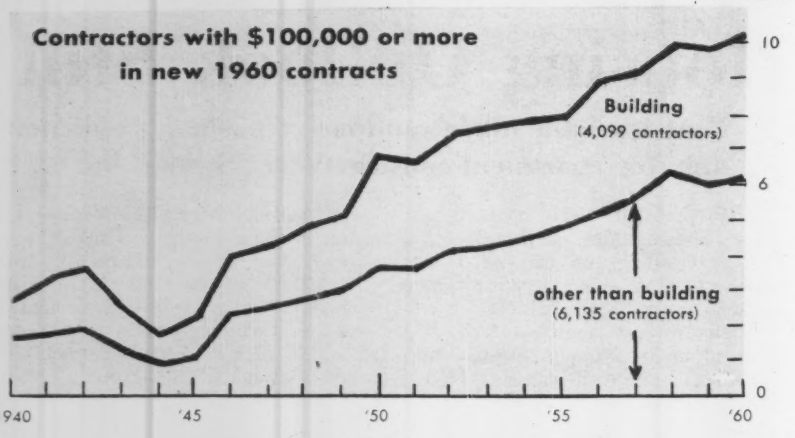
April's slide in order volume placed by distributors contrasts with a substantial rise in April 1960. The difference may reflect the state of contractors' new business; contract volume this year is just barely ahead of last year. Sales are expected to climb in year end, according to a survey by Associated Equipment Distributors.

ENR's Contract Awards Index rose sharply in April but was 9% under the same month of last year.

May volume pulled the index down slightly to 174, based on 1950 as 100. Although January volume was sharply higher than 1960, May awards were under a year ago for the fourth consecutive month. At the end of five months, 1961 contract volume was only 1% ahead of that in 1960's comparable period.

And volume in the first 25 weeks was only ¼ of 1% ahead of the volume for the same period last year—$10.47 billion compared to $10.42 billion last year.





Contractors' $100,000-plus club grows . . .

Membership Hits Record 10,234

A record number of contractors—10,234—won new-contract volume of $100,000 or more last year. This is 3% above 1959's total.

In the face of 1960's record, however, diversification by contractors declined. Analysis of ENR's contract-award data shows that in 1960 fewer contractors took on the following types of work: waterworks, sewerage, bridges, earthwork-dams-waterways, airports, industrial building, public office buildings and public industrial-military-atomic energy buildings.

The rise in all heavy construction contractors getting at least $100,000 worth of new work last year offset 1959's dip.

The number of building contractors in 1960 rose 4% to 4,099. But the number of contractors doing other than building rose only 1% to 6,135.

The big-volume contractors—those doing $1 million or more—showed a more rapid increase last year than those in the $500,000 to $1 million and $100,000 to $500,000 groups. The "million-dollar" segment rose 8% above 1959 to 3,783. In this grouping, the number of building contractors rose 8% to 1,847, while those doing other than buildings work rose 9% to 1,936.

Despite last year's slide in housing starts the number of "million-dollar" building contractors taking on housing contracts rose to 592, an increase of 17%. This was the second largest increase among all work-types. Biggest boost was scored by building contractors getting private office building contracts—23% to 183.

In the middle category—$500,000 to $1 million—the number of contractors rose 3% to 2,095. In this sector, building contractors increased their number by 7% to 994. The number of contractors doing other than buildings remained stable—1,101 in 1960 compared to 1,104 in 1959. Increases in the number of building contractors resulted largely from the increase in contractors getting contracts for private buildings of all types and public schools. In the other than buildings group, a generous increase in the number of contractors getting highway and sewerage contracts was not sufficient to offset drops in various other categories.

Middle-size building contractors doing housing increased by 13% in 1960, moving up from 237 in 1959 to 267 last year. Biggest percentage increase in the middle-size building contractor category was scored by those doing private office buildings. Their number, however, is relatively small—38 in 1960, compared to 30 in 1959.

The $100,000 to $500,000 category showed a slight decline in number, falling 2% in 1960 to a total of 4,356. Other-than-building contractors totaled 3,098 in 1960 compared to 3,168 in 1959. Building contractors also showed a slight decline, falling from 1,298 in 1959 to 1,258 in 1960.

Those doing highway and street work rose 2% last year to a total of 1,265.

Highway and street contractors in the middle-size category also showed an increase in 1960. Their number rose 9% to 582. In the million-dollar grouping, however, the number of highway contractors dipped 2% to 1,011.

The increases in the small- and middle-size group served to offset the dip in the million-dollar category so the total number of number of highway and street contractors in the $100,000-plus club rose 2% to 2,858.

Legal Action Urged in Missile Strikes

Florida group charges that union work stoppages at Cape Canaveral violated state's right-to-work law

The McClellan committee hearings on labor problems at missile sites are playing into the hands of those who support right-to-work legislation as a means of curbing union power.

The Florida Right to Work Committee contends that the right-to-work amendment to the Florida constitution has been violated repeatedly at Cape Canaveral. It has filed a formal petition with the state attorney general requesting that immediate action be taken against the offenders.

The committee alleges in its petition that 23 work stoppages, resulting in the loss of 9,045 man-days at the Cape, were attributed to union actions that clearly violated the intent of Florida's right-to-work law.

Appearing in the Declaration of Rights of the Florida constitution, the law provides that "the right of persons to work shall not be denied or abridged on account of membership or nonmembership in any labor union . . ." Effect of the provision is to outlaw the union shop as well as the closed shop, which has been illegal under federal law.

In its petition to the attorney general, the Florida Right to Work Committee claims that:

- Florida citizens were denied the right to work at Canaveral because they chose not to belong to a certain union.
- Nonunion workers were forced off jobs.
- Other workers were coerced into union membership or into paying union fees or assessments against their will in order to get or hold jobs.
- Contractors using nonunion workers were forced out of existing Canaveral contracts and prevented from taking new contracts.

The McClellan hearings have attempted to show that numerous labor disputes have delayed the missile program and that union jurisdictional and overtime practices have padded costs.

In rebuttal, organized labor has charged that the hearings are designed as smears to distort the truth. Building Trades' President C. J. Haggerty, who was not given a chance to testify before the McClellan committee, says the record shows that most of the missile lag has been caused by non-labor factors.

The Florida and National Right to Work committees have taken some of the more sensational McClellan committee disclosures at face value. They have toted them up to a "frightening show of power put into the hands of union officials by compulsory unionism."

Explaining how failure to enforce the Florida right-to-work law is the root of the Canaveral evil, the national committee says union officials had to find some way to defeat the law in order to "wield the power over the Cape that they wished to exercise."

"So, at the beginning of the crash program," the committee asserts, "certain union officials contrived a device to obtain full monopoly power over all jobs. Their 'closed shop' unions would simply walk off the Cape, and effectively paralyze all work, if nonunion workers appeared and sought work. A total of 23 work stoppages of this nature ensued. Ultimately, merely the threat of such stoppages caused nonunion workers to be ousted from the Cape—and the contractors who employed them. With this club of monopoly unionism, union officials bulldozed government officials, Army officers, and contracting firms into wasteful pay rates and working rules, and in doing it they delayed progress on some of America's most important projects for national defense."

Court Hands Unions Political Quandary

The U. S. Supreme Court last week curbed the use of union dues for political purposes. But its decision may afford only illusory comfort to those who are disturbed by the political power of organized labor. The court was deeply divided and it left many questions unanswered.

By a five to four vote, the court held that railroad workers covered by a union shop clause in their labor contracts can prevent their dues money from being used for union political programs with which they disagree. However, the court was unwilling to extend the principle of majority rule to political action.

The application of the court decision, however, is very narrow. It deals only with a union situation under the Railway Labor Act. It does not affect the 17 million employees covered by the Taft-Hartley Act.

Nevertheless, the fact that the ruling is the first to trim, even moderately, union operations in the political arena is expected to spur new lawsuits by political minorities that come under Taft-Hartley. But it may take years of additional litigation to clarify the legal rights of these individuals.

In the meantime, three aspects of the decision lend support to the view that all of organized labor may eventually be forced to revamp its political operations:

- At the present time, legal restrictions do exist against the use of dues money for direct support of political candidates. This is why the AFL-CIO, for example, makes so much of "voluntary" contributions. Use of dues money for "educational" purposes, however, is considered permissible. But many of these activities do touch on political causes supported by one party or another and may come within the orbit of the court's decision.
- The new decision allows a union railroad worker who protests the political activities of his union to recoup that share of his monthly dues that goes into such a program. This raises the possibility of accounting hassles and refunds on other fronts and may prove to be an incentive to more litigation.
- The court left unanswered the constitutional question of whether a worker's rights of free speech are violated by the requirement that he join a union with which he has political differences. Dissenting from last week's decision, Justice Hugo Black said compulsory union membership under such circumstances is a violation of the First Amendment. This may give other political dissidents a fairly good toe-hold in future litigation.

It is this area of constitutionality that still remains the critical issue around which most of the new court action is likely to center.

In these cases, it will be necessary to show that the court's dues-refund remedy is not enough to satisfy the law.

Dual Role Allowed

Union-member employers have some voting rights

Can union members who become card-carrying contractors continue to participate in the affairs of a local union?

The answer seems to depend on the kind of participation. And National Labor Relations Board officials are wondering where the line should be drawn.

The Board has been taking a look at the employer-studded Philadelphia bricklayers Local No. 1, to which, for example, the late John B. Kelly, bricklayer-contractor and father of Princess Grace of Monaco, belonged.

Now in question is the right of member Andrew Cromwell to vote in union elections. Mr. Cromwell has become an employer representative and is executive secretary of a masonry contractors' association. In that capacity, he gets into collective bargaining and other problems on the employer side.

A few years ago, the business agent of Local 1 successfully challenged Mr. Cromwell's right to vote in choosing members of the union's negotiating committee. Now he has challenged Mr. Cromwell's right to vote for delegates to the union's convention.

The law does not forbid retention of union membership by a union member who has become a contractor, but it does bar employer interference in union affairs.

NLRB trial examiner James A. Shaw, in a report filed this month, said even though members-turned-employers cannot help select union bargainers, they should be permitted to vote for convention delegates. He upheld Mr. Cromwell's right to vote and said the selection of such delegates is "far removed from the sphere of collective bargaining," which is the critical area of pollution by employer interference.

"If the Board can deny the right of a long-time member to vote in an election for delegates to an international convention, can it go further," Mr. Shaw asked," and in a future case deny Cromwell or persons similarly situated the right to attend union meetings?

"Will it next be called upon," he added, "to deny them the facilities of the hall where some, no doubt, in a nostalgic mood like to toddle around now and then to recall the day of their youth as apprentices in the industry?

"The Board sooner or later must call a halt somewhere," Mr. Shaw said. He would draw the line at participation in union policy determinations at the collective bargaining level.

OFFICIAL PROPOSALS

RATE: The rate for official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

See filler on page 312

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

TRINIDAD & TOBAGO ELECTRICITY COMMISSION

PORT OF SPAIN "B" POWER STATION

CONTRACT NO. 216

P.C.R. REF. NO. 1054/1011

Tenders are invited for the supply and erection of TWO 50,000 kw Turbo Alternators and ancillary plant for the Port of Spain "B" Power Station.

Tenders are invited only from firms who are prepared to submit complete tenders for each contract.

A short precis of the extent of the works for which complete and comprehensive offers are invited may be had on application to Messrs. Preece, Cardew & Rider, 8, 10 & 12 Queen Anne's Gate, London, S.W.1.

Tender documents, which will be available from 19th June 1961 and returnable by mid-day on 11th September 1961, may be obtained from the same address on receipt of a payment by cheque for £15. O. O. in favour of Preece, Cardew & Rider. This payment will not be refunded.

At a later date offers will be invited for Auxiliary Switchgear and Cabling. Persons interested in such should NOT now apply, but await further advertisements.

The Trinidad & Tobago Electricity Commission does not bind themselves to accept the lowest of any Tender, nor will they be responsible for any costs incurred by Tenderers on making their Tender.

Bids: July 13, 1961

The Port of New York Authority Newark Airport

EXPANSION OF PARKING LOT NO. 2
CONTRACT O & M-637

Sealed proposals for the Expansion of Parking Lot No. 2 at Newark Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A.M. o'clock July 13, 1961, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York,
June 29, 1961

Bids: July 13, 1961

New York State Road Work Harlem River Drive

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Advanced Eastern Standard Time, on July 13, 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON HARLEM RIVER DRIVE, 155TH STREET TO HARLEM RIVER DRIVEWAY, NEW YORK COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. SM-184.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Austin M. Sarr, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made *only* in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $36,800.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Department of Public Works" for the sum of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

Bids: September 11, 1961

Empresa de Energia Electrica de Bogota Colegio and Canoas Power Tunnels

Tenders are invited for two, concrete lined, circular power tunnels with the following characteristics:

Colegio Tunnel, length 8500 meters, inside diameter 3.6 meters.
Canoas Tunnel, length 3300 meters, inside diameter 3.4 meters.

All tenders are to be on a unit price basis and may be submitted for one or both tunnels. The tender documents are available on request from Empresa de Energia Eléctrica de Bogotá, Apartado Aéreo 4453, Bogatá, Colombia, after July 10th, 1961 and may be obtained by prospective tenderers at the cost of Col.P. 3,000 or US$450.00. Date of submittal is September 11, 1961.

OFFICIAL PROPOSALS enable you to get the greatest variety of bids —and so to get the lowest prices consistent with the best work.

OFFICIAL PROPOSALS

Bids: July 13, 1961

The Port of New York Authority Brooklyn-Port Authority Piers Existing Piers 29, 30 & 32

PILE LOAD TESTS
CONTRACT BP-507.303

Sealed proposals for furnishing, driving, load testing and extracting timber piles at and in the vicinity of existing Piers 29, 30 and 32 at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of the Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Thursday, July 13, 1961, at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $20.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, June 29, 1961

Bids: July 25, 1961

Additions and Alterations to the Sewage Treatment Plant Borough of Haddonfield

Camden County, New Jersey

Sealed proposals for the separate Contracts stated below will be received by the Board of Commissioners of the BOROUGH OF HADDONFIELD at the meeting room of said Board in the Borough Hall of Haddonfield, N. J., until 8:00 P.M., Eastern Daylight Saving Time, July 25, 1961, and shortly thereafter the same day, will be publicly opened and read, at the same place.

Proposals will be for furnishing all necessary labor, materials, and equipment, and performing all work of the separate Contracts. Each proposal shall be accompanied by a certified check or bid bond in an amount not less than ten (10) percent of the bid total, all in accordance with the Contract Documents.

Copies of the Contract Documents may be seen at and obtained from the main office of Gannett Fleming Corddry and Carpenter, Inc., Engineers, 600 North Second Street, Harrisburg, Pa., and all requests for Contract Documents must be directed to that address, together with deposit of the following indicated amounts per set. Checks for deposits shall be made payable to Gannett Fleming Corddry and Carpenter, Inc. Not more than two (2) sets of any particular Contract will be permitted a prospective bidder.

Contract One:
GENERAL CONSTRUCTION OF ADDITIONS AND ALTERATIONS TO THE SEWAGE TREATMENT PLANT . . $50.00

Contract Two:
PLUMBING WORK IN CONNECTION WITH ADDITIONS AND ALTERATIONS TO THE SEWAGE TREATMENT PLANT $30.00

Contract Three:
HEATING AND VENTILATING WORK IN CONNECTION WITH ADDITIONS AND ALTERATIONS TO THE SEWAGE TREATMENT PLANT $30.00

Contract Four:
ELECTRICAL WORK IN CONNECTION WITH ADDITIONS AND ALTERATIONS TO THE SEWAGE TREATMENT PLANT $30.00

Copies of the Contract Documents may also be seen (but not obtained) at a branch office of Gannett Fleming Corddry and Carpenter, Inc., at 12 East Montgomery Avenue, Ardmore, Pa., and at the Borough Hall, Haddonfield, N. J.

Full refund will be made only to actual bidders on the Contracts stated above, for return of one (1) set, no more, of a particular Contract in good condition within fifteen (15) calendar days after bid opening. Refund for return of all other sets within the same period, whether taken out by bidders or non-bidders, will be fifty (50) per cent of deposit. No refund will be made for Contract Documents returned later than fifteen (15) calendar days after bid opening.

The Owner reserves the right to reject any or all Proposals.

BOROUGH OF HADDONFIELD
Gannett Fleming Corddry
and Carpenter, Inc.
Engineers

Bids: July 20, 1961

New York State Road Work Willowbrook Expressway

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Advanced Eastern Standard Time, on July 20, 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON WILLOWBROOK EXPRESSWAY, CLOVE LAKES EXPRESSWAY TO BAYONNE BRIDGE, RICHMOND COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. SM-185.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Austin M. Sarr, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made *only* in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $31,300.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Department of Public Works" for the sum of $1,750.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF
PUBLIC WORKS

Bids: July 18, 1961

Power Authority of the State of New York Niagara Power Project

ADVERTISEMENT FOR PROPOSALS
FOR
GRADING, TOPSOILING AND SEEDING WATERWAYS, WORK SECTION III FROM STATION 202+00 TO STATION 226+70 IN LEWISTON AND NIAGARA, NIAGARA COUNTY, NEW YORK
SPECIFICATION NO. PA-N-23050
NIAGARA CONTRACT N 41

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals for grading, topsoiling and seeding, Work Section III, from Station 202+00 to Station 226+70, in Lewiston and Niagara, Niagara County, New York, until 10:30 A.M., Eastern Daylight Saving Time on the 18th day of July, 1961, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are: Estimated:

74 Acres	Grading
1,800 Sq. Yards	Sodding
55.6 Acres	Topsoiling, 4" thick
16.4 Acres	Topsoiling, 6" thick
72 Acres	Preparation of seed bed, applying ground limestone, seed, mulch and maintenance

All work shall be completed on or before December 1, 1962 including maintenance.

Plans, specifications and proposal forms for the work may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the total of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-N-23050

District of Columbia—Building Construction—Dept. of Buildings & Grounds, D. C., June 6, 1961. CONSTRUCTION OF NEW ELEMENTARY SCHOOL, 4th and W Sts., N.W., Washington, D. C. (Invitation No. C-61151-B). Wage rates have been predetermined by Labor Dept. Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $75.00 per set, payable to D. C. Treasurer, (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EDT, July 11, 1961, in Room 424, 499 Penn. Ave., N.W.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5618) will be received at Gunnison, Colorado, until 10 a.m., Mountain Standard Time, July 20, 1961, for furnishing labor and materials for Blue Mesa-Gunnison 115-kilovolt Transmission Line, Transmission Division, Colorado, Colorado River Storage Project. Location near Sapinero, Colorado. Principal items are 201 structures—Furnishing and constructing structures of various types and maximum pole lengths; 21.72 miles of line—Furnishing and stringing three 556,-500 circular-mil, ACSR, 24/7 conductors; and other work. Completion time 180 days. For particulars, address Bureau of Reclamation, P. O. Box 360, Salt Lake City 10, Utah; P. O. Box 179, Gunnison, Colorado; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5621) will be received at Klamath Falls, Oregon until 10 a.m. Pacific Standard Time, July 26, 1961, for furnishing labor and materials for Earthwork and Structures for Laterals and Drains—Sump 3, Contract Unit 2—Klamath Project, Oregon-California. Location near Tule Lake, California, in Siskiyou and Modoc Counties. Principal items are 510,000 cu. yds.—excavation; 69,000 cu. yds.—earth lining; and other work. Completion time 480 days. For particulars, address Bureau of Reclamation, P. O. Box 2511, Sacramento, California; P. O. Box 312, Klamath Falls, Oregon; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE

The advertising rate is $45.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

JULY 13TH ISSUE CLOSES JUNE 30TH

UNDISPLAYED RATE

$2.70 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

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Electrical Engineer—Estimator—man with experience in electrical estimating particularly in industrial, pole line, and power plant work. Reply to "Estimator" Box 1078, Columbus, Ga.

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Civil Engineer or Engineer in Training—able to obtain registration in Ohio. Interest in Expressway and Freeway Planning, design, construction. Starting salary—Engineer up to $7987; Engineer in training up to $6895 depending on experience. Other benefits. Apply: Chief Engineer, Room 531 Municipal Bldg., Dayton 2, Ohio.

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Resident Engineer—Bridges and other heavy construction, must be experienced, good engineering background and bearing, capable of assuming other professional assignments, excellent opportunity, upstate New York, Consultant, send complete resume, all correspondence acknowledged, P-6983, Engineering News-Record.

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(Continued on the following page)

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(Continued from preceding page)

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Construction Superintendent past retirement but still active desires job as inspector for architect or owner or subordinate job with contractor. PW-6824, Engineering News-Record.

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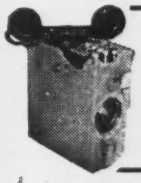

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Editorials

Proud of Your Industry?

It's sickening. The news of construction scandals from every corner of the country seems to have hit a new high—or low. Each day's mail brings reports of questionable or wrongdoings on the part of some contractor, engineer, architect, supplier, subcontractor, owner, inspector or law enforcement official. Every daily paper across the country seems to find copy in the evils of the construction industry. General magazines and general business papers feature stories on "dirty money" and "bundles of boodle"—construction stories all.

Take a sampling of the shocking shenanigans reported in this week's lead story: Presents from contractors to public officials; political campaign funds requested of architects by public officials influential in engaging them; multiple consulting fees paid in cases questionable on conflict-of-interest grounds; a city considering suing builders for big repair bills on relatively new construction; payola; shoddy construction, kickbacks.

You name it, we've got it. This construction industry of ours is big and strapping. All the more sickening to see the open sores and contemplate the interior infections that are sapping its strength, characterizing it "unclean" in the public mind.

These are strong words. But it's time for strong words—past time. It's time for contemplated and concordant action by every firm and organization in the industry against the evils everyone knows exist. From the petty payment of the ten-dollar bill to a plan inspector to inspect your plans, as he's salaried to do, to the $500 political contribution or the monthly cash handout in the plain envelope—corruption has to stop.

Individuals can't stop it, we're told. The money takers could drive a man out of business with their obstructionism if he balked at greasing their sticky palms. Agreed. Individuals can't stop it, unless every individual stops it at once. It's a big problem and it calls for big, concerted action. It calls for agreement in every professional, functional and trade organization within construction that evils can be stopped. Stopped, not lessened. Every last bit of the hanky-panky that goes on could stop tomorrow if everyone who reads this page vowed that it must. Perfection is beyond the reach of man; but reach he must. The conduct of this industry of ours is so far from perfect that it's sickening. When are enough of its leaders going to become sufficiently nauseated to do something about it?

Slumber in the West

With many American cities waking up to the need for rigorous housing code enforcement, Phoenix, Ariz., has chosen to fall asleep. Obsessed with the quaint notion that a housing ordinance is a "police state" measure, some naive citizens of Phoenix have joined with others not-so-naive to force the City Council to repeal a housing code enacted in 1959 (see p. 19). As a consequence, Phoenix has for the past four months presented the spectacle of a city with no municipal ordinance requiring indoor bathrooms, hot and cold running water and other amenities that Americans accept as a mark of Twentieth Century civilization.

The most controversial provision in the late, and apparently unlamented code, made refusal to admit a housing inspector an offense punishable by fine. This, maintained the misguided ones who helped kill the code, was an infringement of personal rights.

The argument is, of course, too ridiculous to merit serious rebuttal. The American people have accepted the need and the courts have upheld the rights of state and municipal governments to enforce automobile inspection, building and housing codes, plus fire and other regulations needed to insure minimum standards of public safety and health. To oppose government responsibility in any such area is absurd.

Protest against the Phoenix housing code was tied in with a rejection of federal public housing and urban renewal programs. But the city didn't have to repeal its housing code, and thereby make itself ineligible for federal aid, in order merely to refuse such aid.

Apart from the moral responsibilities, there are sound economic reasons for enforcing a good housing code. Tax assessments almost always reward slum landlords for letting their properties decay, so slum properties are always subsidized by the better sections of the city.

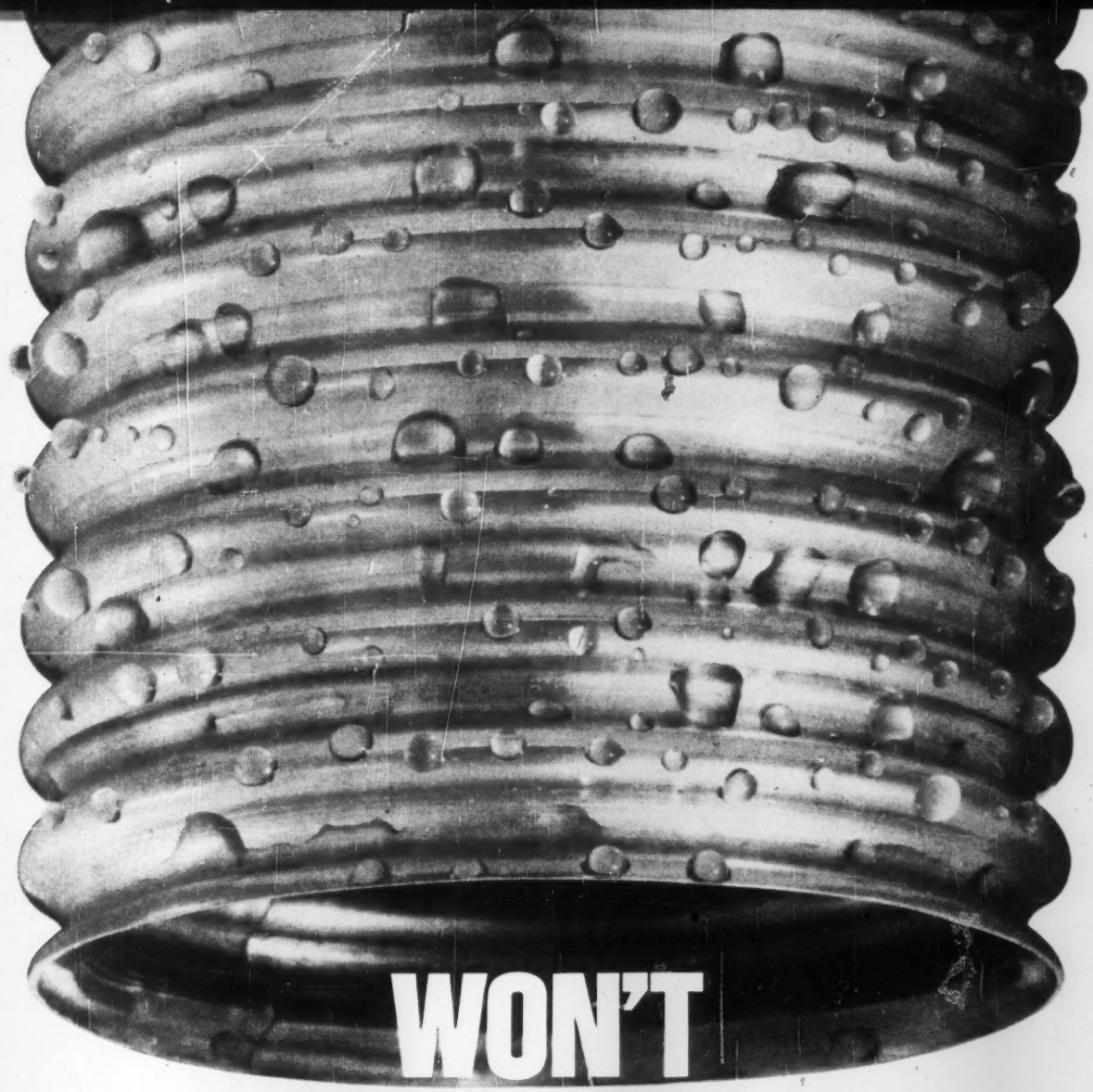
With 14% of its dwelling units rated as "deteriorating" or "dilapidated" in the 1960 Census and its rapidly growing population now over four times the 1950 count, Phoenix faces greater future problems; it could easily repeat the tragic experience of many American cities now paying the high price of procrastination. It is time for engineers, architects and builders to arouse themselves and the citizens of Phoenix from their slumber.

Dry Feet for Ramses

We are impressed with the boldness of the Egyptian government and its financial backers at committing $70 million to save the Abu Simbel Temples from watery obscurity on the bottom of Aswan Dam's reservoir (see p. 22). We stand in awe at the funneling of such a huge sum into salvaging something that can't possibly (this is sure to raise curatorial hackles) make the practical return usually demanded of great engineering projects.

What a great economy it would be now if the ancients had had the forethought (which we seem to lack, too) to build such an antiquity-to-be above the flood plain.

It is also titillating to wonder which of the wonders will more impress the viewer of 2,000 years hence—the 5,000-year-old multiple images of Ramses or the 2,000-year-old cliff-raising works that put him high and dry.



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